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# THE SECRETS OF TRICK PHOTOGRAPHY

BY O. R. CROY

*Authorised Translation*  
*by P. C. Smethurst*

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The progress of the amateur photographer from his first snapshots to technical experience nearly always follows the same course. At first, knowledge comes slowly, but later it comes faster and faster. Personal taste steps in, and experience combines with it to produce an individual style . . . until a point is reached where ideas suddenly disappear overnight, and an aching void takes their place. This paralyses all creative activity, and the sufferer is disheartened to the point of disgust, for he forgets his earlier successes and feels that there is no opening before him which will lead to new ideas and better results. It is almost as if a wall had arisen in front of him, as much as to say "Thus far and no further."

The aim of the present book is to help to break down the wall of stagnation, and in it I have assumed that the reader is already acquainted with technicalities in order that it may start at the point where most amateurs find they stop short. I have set down a good deal of explanation and advice in the attempt to be helpful, but it is not my intention to provide about a hundred recipes for a similar number of more or less unusual pictures. The examples remain examples only, and are meant to stimulate the reader to do something better, but it would be a pity if certain unexplored fields of photography were overpopularised merely because of a desire for easily earned personal notoriety. The value of the result is ultimately the value of the work which has been put into it.

This book is consequently not to be taken as a passport for photographic pirates. On the contrary, it should stimulate and deepen thought, and lead to better pictures without leading readers towards cheap and sensational effects. I have particularly avoided introducing personal feelings into the text, because taste is a matter that is between every photographer and his own conscience.

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## PHOTOGRAPHY WITHOUT A CAMERA

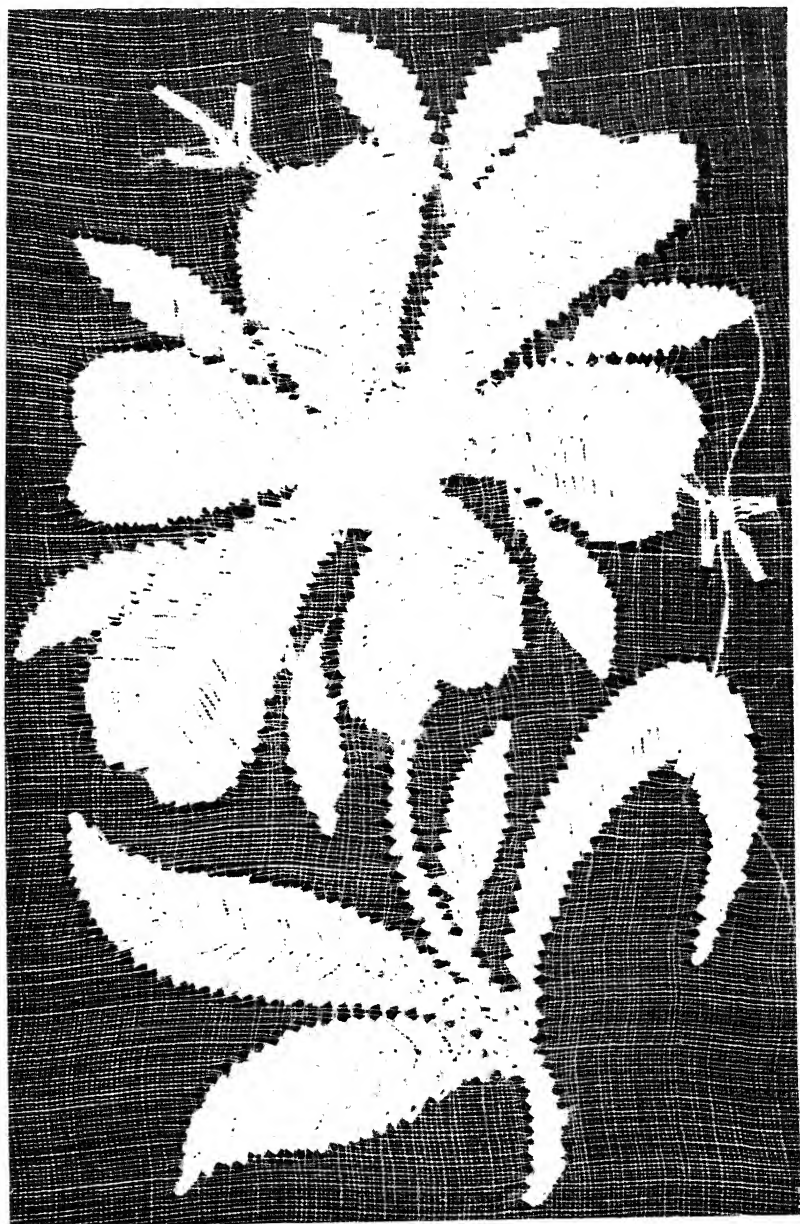
About a hundred years before the actual invention of photography, Dr. J. H. Schulze, a German Professor of Medicine, discovered that silver salts were darkened by exposure to light, and used the discovery to copy manuscripts. His sensitive papers were quite similar to those of today, though lenses and cameras for making negatives did not then exist. At that time his knowledge that silver chloride, which was naturally white, was darkened by light to black, was sufficient to make it possible to produce "negative copies" of his originals.

To photograph means to "write with light," so that this discovery (which is sometimes called Schulzegraphy) is the simplest form of photography there is. Objects or their shadows can easily be reproduced by the process: we can take as an example a piece of fine embroidery or pressed leaves and flowers, which are laid on a sheet of sensitive paper and "printed" to a "white shadow" outline. The result is rather like those which were popular in earlier days, and were made by placing a fern or similar plant on a piece of wood and scattering coloured solutions over it with a brush and sieve. Instead of a coloured image, which resulted from these obsolete processes of reproduction, the black image of silver chloride appears as a substitute.

By such a method, the limits within which the results are interesting are rather narrow, but with one or two modifications the process can be very useful to photographers. Transparent or semi-transparent objects, cloth, and anything with a pronounced surface structure, can be printed on sensitive paper to give the most varied effects, and the type of lighting and its direction can be altered to give many variations in the result. Diffused light gives a different result from parallel light, and shadows are quite different in oblique light from vertical light. Different combinations such as opaque objects with negatives, transparent positives, masks, and diffusing screens all increase the range of Schulze's process.

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**SILK EMBROIDERY.** Printed like a negative on development paper. The threads are more sharply rendered by contact printing than they would if a negative were first made.



## PHOTOGRAM: LIGHT ORNAMENTS ON THE PLATE

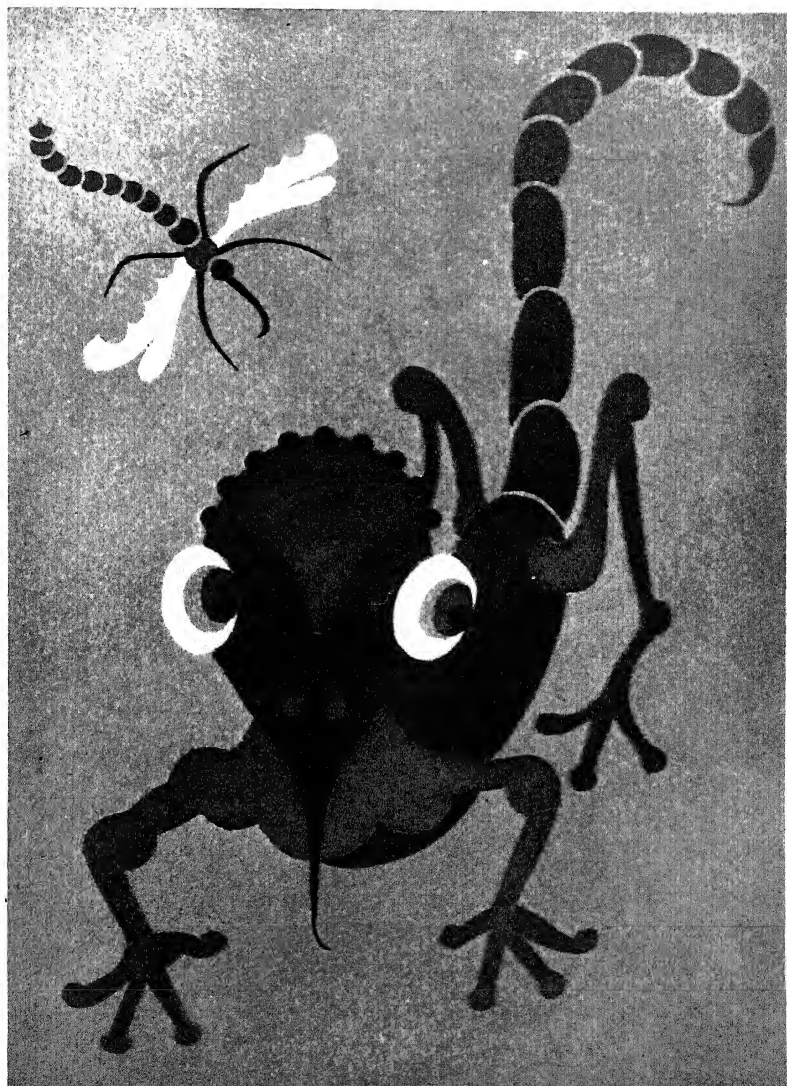
Photography is really intended to produce a factual record of the world around us, and reaches its highest point in a picture that is true to nature, but photographic methods can produce pictures that are quite similar to the products of the graphic arts. The photogram is one means of getting results similar to etchings, lithographs, or wood-cuts, and while in these three crafts it is colour that produces the picture, in the photogram we use light instead.

The necessary equipment consists of sheets of opaque black paper and tracing paper. The various figures and shapes are cut out of these papers and printed on gaslight paper in the ordinary way. To get the various grey tones, the same exposure should always be given in printing, but experiments must be made to find out the effect of one, two, or more layers of tracing paper on the tones of the picture. The process is then worked by leaving the printing paper uncovered where the picture is required to be full black, while the various grey tones are produced by layers of tracing paper of varying thicknesses. The black paper is finally used to get the full white of the printing paper after development. If it is desired to have a large number of grey tones, a correspondingly large number of layers of tracing paper will be required, but since the effect of a photogram is usually at its best if it appears only in the three tones white, grey, and black, the tone scale can usually be compressed to these limits. A little imagination and some skill in cutting the masks are all that are necessary to get a really striking "print." The shortest scale of tones usually gives the best effect: it is always true that the value of creative work lies in economy and not in superfluity.

Variations in the result can also be produced by using a pocket lamp as a "light brush," while lines of varying thicknesses can very easily be made by making stencils and laying these over the picture area. The various light intensities given by a large or small masking hole must naturally be taken into account in the former case.

---

THE WORM OF CONSCIENCE. Made by a single black mask and four layers of tracing paper of varying thickness.



## COPYING WITHOUT A NEGATIVE

When something has to be copied from a book, or a document must be copied in facsimile, it is not necessary to make first a negative and then a print. Reproductions are easily made without a camera. This is useful in that a reproduction has never the same value as the original, and the cheaper it is to produce, the better.

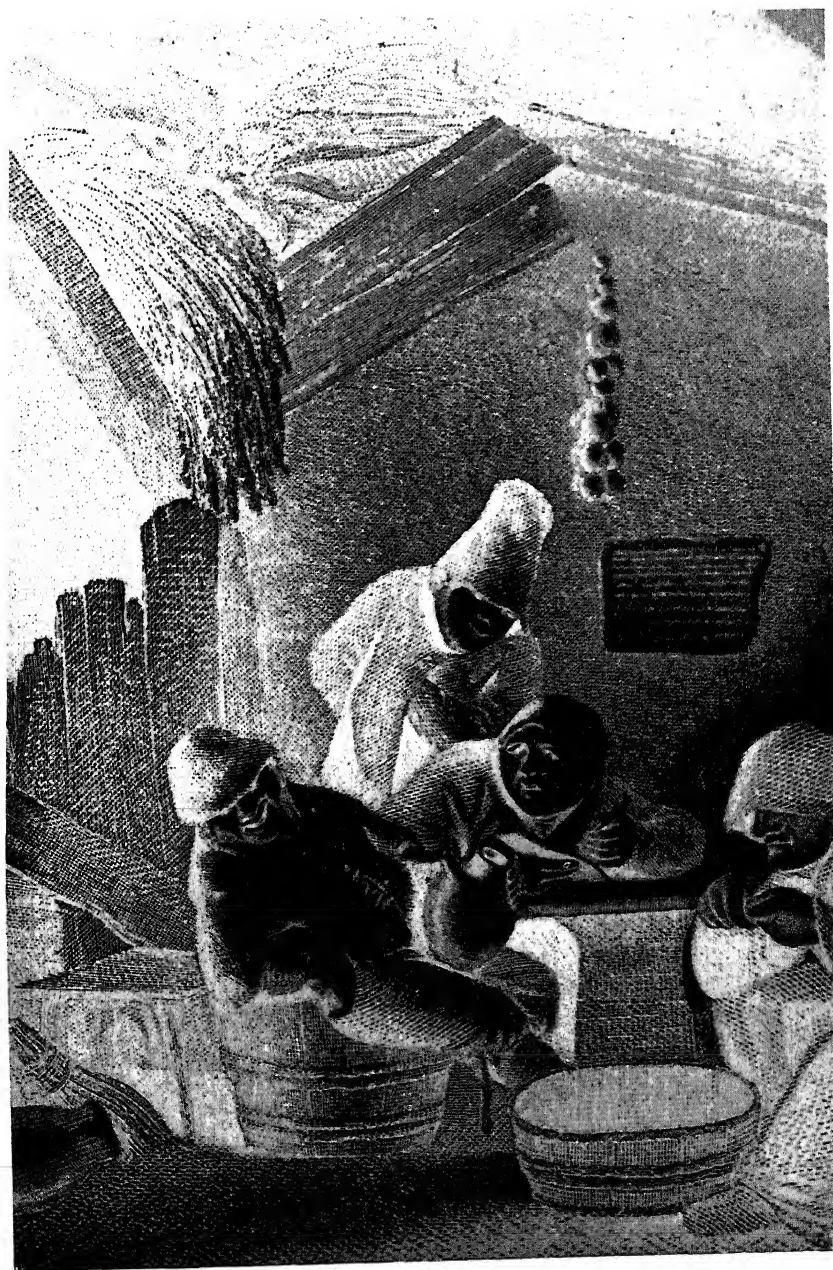
The Reflex Process is one method, and it consists of laying a piece of printing paper face downwards on the original to be copied, while light is allowed to fall on its back surface for a short time. The light passes through the printing paper and is reflected back to its sensitive surface by the white portions of the original, thus exposing it. In the darker portions, the light is absorbed, and when the paper has been developed in a contrasty developer a very useful negative copy of the original is produced. Hydroquinone is to be recommended as a developer, and it should be used concentrated, with extra potassium bromide, in a cold solution.

The Luminograph method is rather different, and uses a plate covered with special luminous paint which must first be exposed to light to activate it. After this a sheet of bromide is placed, in the darkroom, under the page to be copied, with a sheet of black paper behind it. (In this process the book must only be printed on one side of the page.) The luminous plate is then placed over the sheet and the book closed. After a few minutes the radiation from the plate will have exposed the paper, which can be developed in a contrasty developer. In this case, too, the resulting print is a negative copy of the original.

One useful thing about both these processes is that a facsimile the identical size of the original is produced, and another is that there can be no question of falsification during copying. It is not usually troublesome to have a document white on a black ground, for so long as the duplicate is legible other matters are usually unimportant. The cheapness of the process lies in the fact that no negative is required, and that no electricity need be used.

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**REFLEX COPY OF AN OLD ENGRAVING.** It is important that the original paper is not dirty or covered with flecks, since any spots are intensified by the copying process.



## A CAMERA WITH NO LENS

The pin-hole camera, which uses a small hole in a piece of metal foil instead of a lens, must not be disparaged as an inferior instrument. It is often of the greatest value in a variety of photographic fields, particularly since the pin-hole gives an image up to an angle of  $120^{\circ}$ , which makes it possible to take large objects at close quarters. A pin-hole camera, placed horizontally, gives negatives without a trace of distortion, and with equal sharpness all over the negative area. Needle-sharp focus, however, can never be obtained with a pin-hole which is doing duty for a well-corrected lens.

The sharpness of the picture depends on the diameter of the pin-hole, which should be 0.2 to 0.8 millimetres across, and it is important that the hole should be circular and the edges even. Such a hole is best produced by blackening a sheet of metal foil with soot, and then piercing it with a red-hot needle of the correct gauge. When piercing the hole, the hand supporting the needle must be very steady, for it is important to make a circular hole in the metal foil and not an oval one. The latter shape would probably affect the image produced.

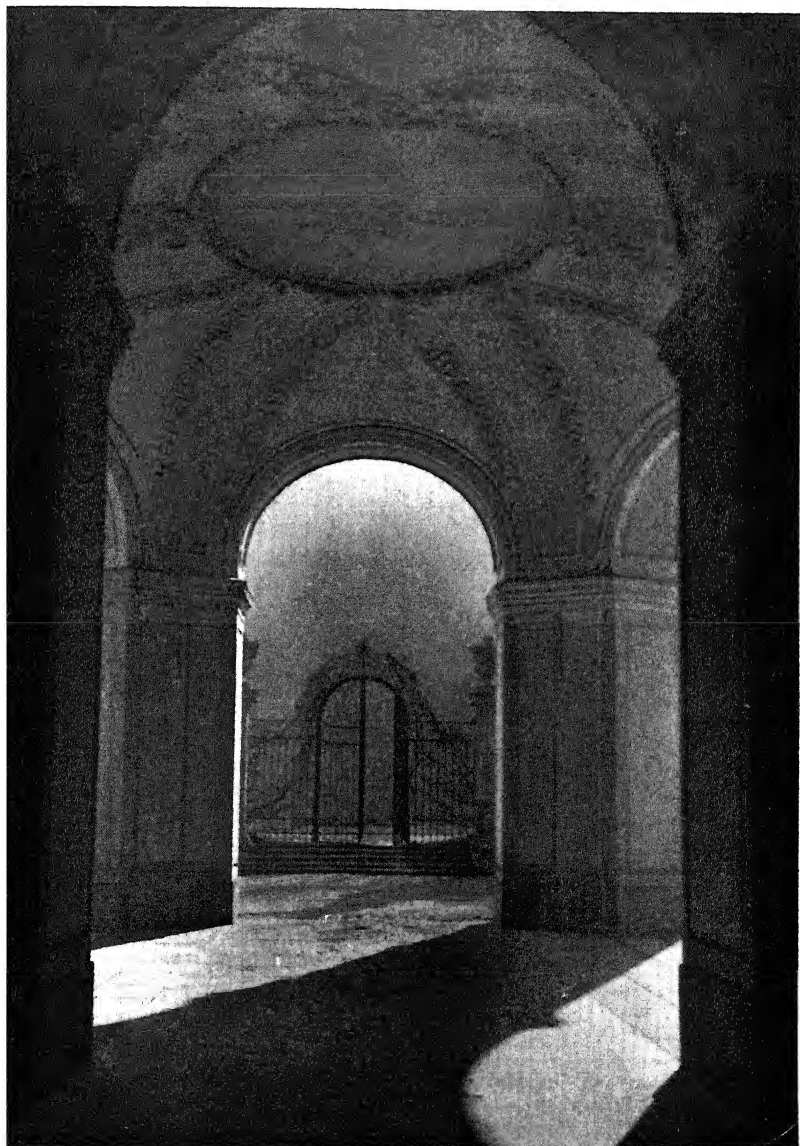
Focussing of the ordinary kind is not necessary, for the negative is always sharp however far the pin-hole is from it, and the only reason the camera extension needs altering is that more or less of the subject has to be included in the picture. The camera is turned through  $180^{\circ}$  from the taking position, and by looking through the pin-hole the extension is arranged so that the correct area of the subject is seen through the open back of the camera. After adjustment, the camera is turned back again to the taking position.

Exposures on an open landscape will be about 20 to 30 seconds with the pin-hole 4 inches from the negative. It is usually recommended that the correct exposure at  $f/32$  for the negative and subject in question is found, and this time is multiplied by sixty. Thus, seconds exposure at  $f/32$  become minutes exposure with the pin-hole.

One special use of the pin-hole is for copying half-tone illustrations in print. The slight lack of focus removes the mechanical screen of the printing block from the negative copy.

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ROCOCO ENTRANCE. May: 11 a. m. Pin-hole 0.4 mm diameter. Four minutes exposure on orthodromatic plate.



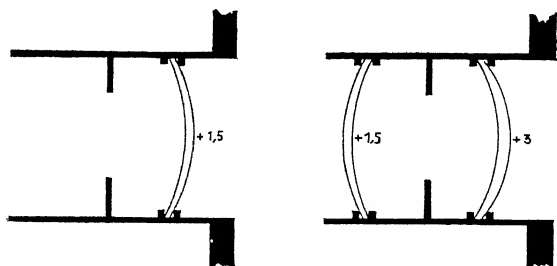


## LENSES FROM SPECTACLES

The simplest photographic lens is a spectacle glass of meniscus type. Such lenses have no correction for optical aberrations, but cost a very small sum compared with a modern anastigmat. They are very useful indeed when soft-focus effects are required. It must be understood that soft-focus is not the same thing as out-of-focus, or as a negative produced with blurred outlines by camera movement during exposure. True soft-focus effects are due to a spreading of the image by aberrations in the lens.

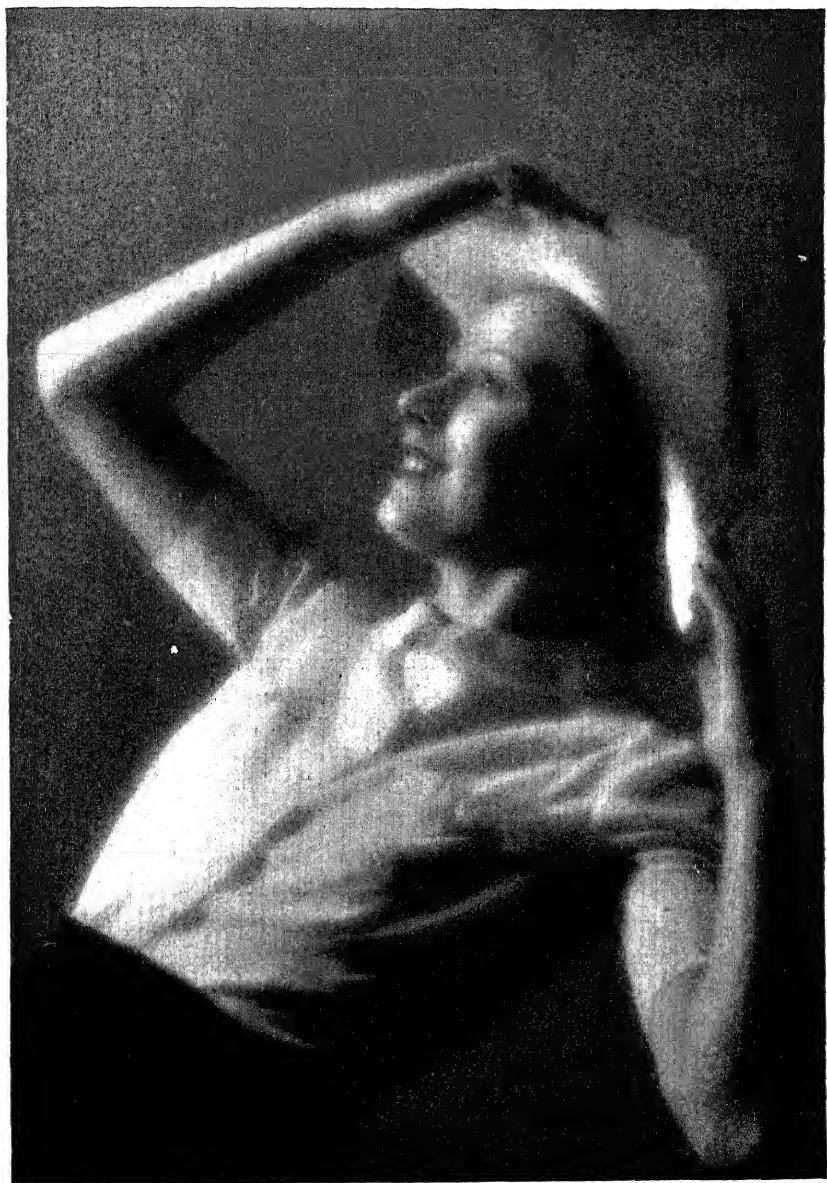
An excellent soft-focus lens can easily be made from a meniscus lens of the "Punktal" type and a piece of cardboard tube. These lenses usually have a diameter of about  $1\frac{3}{4}$  inches, and the focal length is given in "dioptries" instead of inches or centimeters. The number 100 divided by the dioptry number gives the focal length in centimeters, so that a lens of +2 dioptries would have a focal length of  $100/2 = 50$  cm. (About 19 inches.) For a quarter-plate camera a suitable dioptry number would be +5. The glass must be placed with its concave side facing the subject, and the diaphragm, easily made in various sizes of cardboard, must be in front of the lens. The larger the aperture used, the more pronounced the soft-focus effect.

Still softer effects can be obtained by using two glasses, combined to form a "compound lens." The greater the difference in dioptry numbers, the greater the softness. The glass with the larger dioptry number must always be nearest the negative, and the diaphragm must be placed between the two lenses. As an example, lenses of +2 and +4 dioptries combine to give the focal length of about 18.5 cm. (Some  $7\frac{1}{2}$  inches.).



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A BREEZY DAY. Taken with double spectacle-glass lens (+1.5 and +3.0 dioptries) with a diaphragm of 38 mm ( $1\frac{1}{2}$ ") diameter, and one lamp, without reflector, in a dark room.



## SOFT-FOCUS

Those who are used to working with a first-class anastigmat have to learn a good many things over again when they use a soft-focus lens, since a different approach is necessary with the latter. With anastigmats one focusses until the image is as sharp as possible: with soft-focus lenses the camera must be adjusted until the point is found where the sharp "central image" of the lens is seen with a misty diffused image round it. It is the misty image surrounding the sharp one that gives the special "soft" effect, and the more the lens aperture is reduced, the less pronounced it will become. At smaller apertures than  $f/8$ , for example, the diffused image is hardly visible.

Focussing is probably best learned by placing a couple of black cords against a light background such as the sky. The image is fully focussed by moving the lens from the "near" towards the "infinity" position until the black cords appear to be bordered by a black shadow on each side, which makes them seem broader. By racking the lens rapidly backwards and forwards through the point of correct focus, this spreading of the black lines can be very clearly seen.

The lighting has a considerable effect on the aperture to be used. The harder and more one-sided the lighting, the more must the aperture be reduced to stop the image from showing unpleasantly woolly halos. On the other hand, since soft-focus lenses have the characteristic of bringing up shadow detail, the shadows should not be too brightly lit.

The exposure is also affected: the more exposure is given, the smaller the true soft-focus effect and the flatter and more fuzzy the negative image. This means that a shorter exposure must be given with a soft-focus lens than with an anastigmat.

If soft-focus lenses are used in the enlarger instead of the camera, a totally different result is obtained. In the camera, the whites diffuse into the darks, while in the enlarger the darks diffuse into the lights. But a soft-focus lens on the enlarger can be put to good use to reduce negative grain.

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GRAMOPHONE RECORDS. The lens aperture was just large enough to give the desired spreading of the high-lights produced by the backlight used.



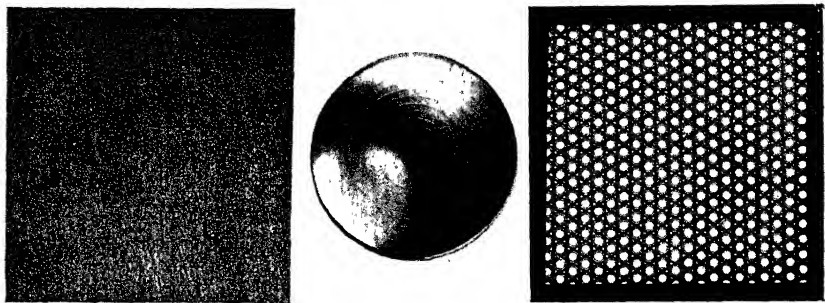
## SOFT-FOCUS WITH ANY LENS

On the market are a number of different devices for producing soft-focus or diffused effects without recourse to the costly soft-focus lens. They are often exceedingly useful in getting soft images, but no two of them give exactly the same result.

The simplest way of getting a diffused image is to rub a little vaseline into circles on a sheet of plain glass, and support it in front of the camera lens. The resulting pictures generally lose their clarity to some extent. The image produced is different when the line of rubbing is vertical and horizontal, for all the high-lights spread either vertically or horizontally, but not in both directions.

Tulle, or georgette crepe, stretched on a frame in front of the lens, are also simple devices for getting diffusion, and different results are obtained from black and white tulle. Since the weave is only in two directions, the diffusion is cruciform and not circular. White gauze will reduce the exposure time slightly — by about 15% — while black gauze will increase it by approximately the same percentage.

Even and circular diffusion is obtained by all those devices which are placed in front of the lens, and have circular rings, either in relief or in black, on them. The only difference is that the relief rings give more diffusion than the black ones.



SUNDAY IN AUTUMN. October, 11 a. m., against the light. Panchromatic film,  $f/4$ , with diffusing disc.

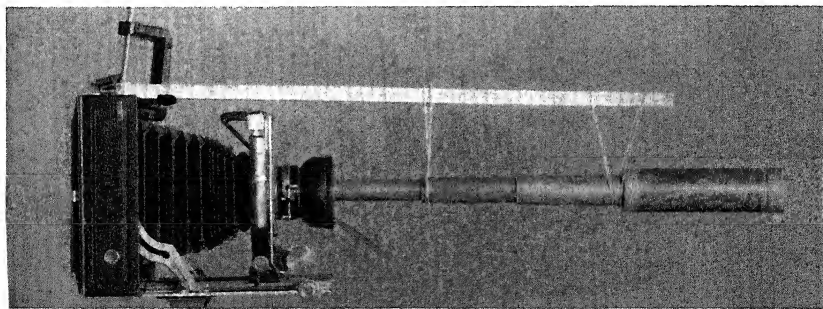


## OPERA GLASSES FOR TELEPHOTO WORK

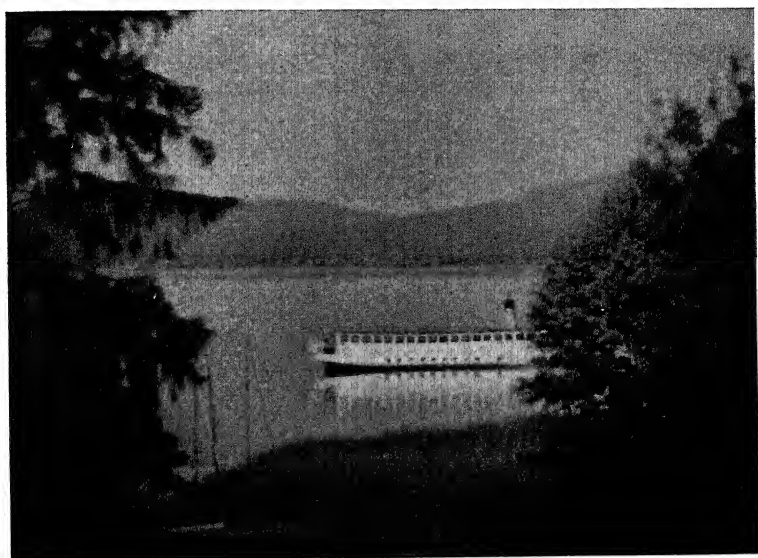
There are excellent telephoto lenses on the market<sup>\*</sup> for long distance work, and they need only a short camera extension, but it is quite easy to adapt either a telescope or a pair of binoculars as a substitute, either in front of the camera lens or instead of it. The optical quality of the result is admittedly not so good as that obtained with a real telephoto lens, but it is quite good enough for all ordinary purposes, particularly if only the centre of the negative image is used in printing, and not the full area. There is no need to be anxious on this account, because to get a real long-distance photograph it is a matter of basic importance to enlarge a small portion of the original negative in order to increase the magnification of the optical system in front of the camera. It is only necessary to make sure that the main subject of the picture is in the centre of the negative, where the best definition is given.

The size of the image depends on the camera extension: the longer the extension, the larger—but less sharp—the image. At short extensions the edges of the picture are noticeably less sharp than the centre. Focussing is arranged by altering the eyepiece adjustment to the telescope, but since many binoculars do not have this adjustment it is better to alter the camera extension when they are used. The sharpness of the picture is increased by stopping down the lens, but a firm support for the camera is even more important if a really sharp negative is to be obtained.

The exposure time varies with the telescope or binoculars used, so that a trial is necessary before serious exposures can be made.



LANDSCAPE. The two pictures were taken from the same view-point; one through an opera glass.





## SHOOTING THE STARS

Telescopes and binoculars make it possible to photograph the sun, moon, or stars. Clear weather is essential when the moon is photographed, for a light mist will give a halation effect on the negative even when it is quite invisible to the eye. The exposure can be quite short. With a panchromatic plate, an exposure of  $\frac{1}{5}$ th to  $\frac{1}{2}$  a second will be sufficient, and longer times than this should not be given, for the moon moves a distance equal to its own width across the sky in less than two minutes.

When the sun is photographed, the plate must be as free from halation as possible, though no great sensitivity is required, and to stop the image spreading it is best to use a plate which has a very thin coating of emulsion. Special thin-film plates and films are used in "process" work, and these will serve excellently. It is also useful to place a diaphragm in front of the object glass of the telescope which reduces its effective diameter to  $\frac{2}{3}$ rd of the full size.

To show the tracks of the stars across the sky, the camera is merely set up and a sufficiently long exposure given. To include as much of the sky as possible, a wide angle lens may be used, and the star-tracks will appear as lines across the negative. Since stars move relatively slowly, it is perhaps better to give a short exposure every fifteen minutes, the exposure time being perhaps one second. The tracks will then appear as a series of dotted lines across the negative.

To show the moon or sun on an enlarged scale, a reading glass or other simple lens of long focus can be used to throw an image on a piece of white paper, and a camera with double extension used to photograph the image on the paper as if it were being copied. The shorter the focal length of the camera lens, and the longer the extension, the greater the scale of reproduction.

The surface on which the image of the sun is thrown should not possess any well-defined structure. Rough and linen-surfaced papers cannot thus be used. The best material is probably a flat porcelain plate with a smooth surface, or a piece of wood painted with a smooth, pure white paint.

---

ECLIPSE OF THE MOON. Panchromatic plate, exposures of  $\frac{1}{5}$ th second every ten minutes. The long-focus lens enlarges the image satisfactorily.



## LIGHTNING

The proverbial speed of lightning can be got over very easily by making the exposures at night, particularly since the camera can be pointed out of the window, and there is no necessity to get it wet by rain. The camera is pointed in the direction from which a flash is expected, and this direction is easily determined since a single flash seldom makes a storm. Flashes usually follow each other in rapid succession. It is best to use a wide angle lens so that as much sky as possible is included, and there is a better chance of getting the next flash recorded on the negative. It is, of course, necessary to find a place high up near the roof from which one may obtain a clear view. Particular attention should always be paid to lightning conductors and to radio aerials, since these can appear in the picture and look exceedingly unpleasant.

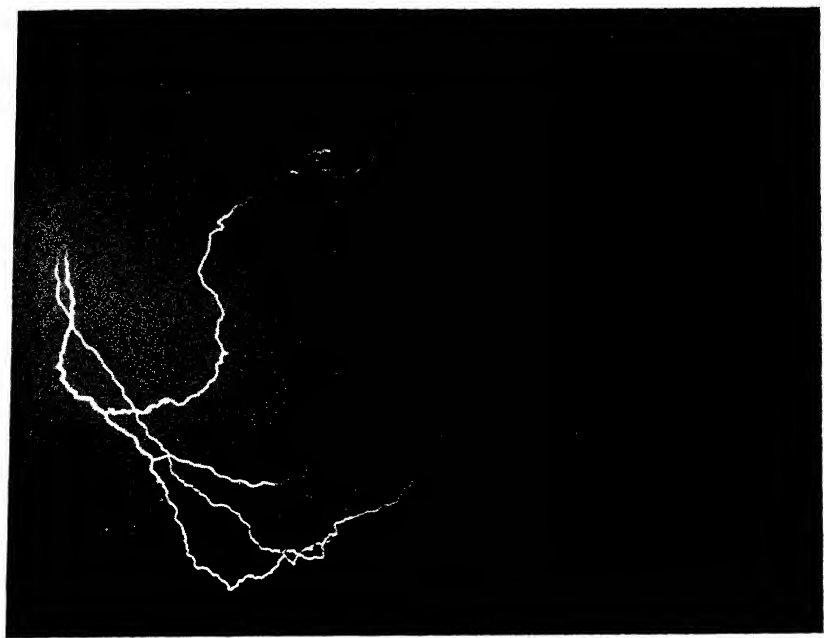
It is much more difficult to photograph lightning in the daytime, for the lens cannot be kept open for some time to catch the next flash. In this case it is better to hold the camera with the shutter wound, waiting for a flash, and to snap the shutter the moment a flash appears. It is quite probable that some kind of record will be obtained, since each flash is commonly followed by subsidiary ones, and one or other of these will be caught by the camera. It is no use taking a single exposure and imagining that it is sure to come out correctly. In often happens in the heat of the moment that only half a flash is caught by the plate, and it is quite impossible to try to do something with the resulting negative. The more exposures are made, the more likely it is that one of them will have a good lightning record on it.

A simpler and more pictorial way of showing lightning in daylight is to take a few photographs of flashes at night in the ordinary way, and develop them to a very clear negative, so that only the lines of the flash appear dark. These negatives may then be enlarged in combination with one of an ordinary daylight landscape to produce the effect desired. In printing the two, the negatives are merely placed with their emulsion sides in contact.

It is an advantage to take the lightning negative on a larger plate or film than that of the landscape, so that the two can be moved about until the lightning appears in a suitable place in the picture.

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STORM OVER THE ADRIATIC. The flash was taken separately, and then combined with a night exposure made in quite a different place.



## FIREWORKS

The simplest camera and a comparatively small-aperture lens can turn out good pictures of firework displays, for every single rocket automatically exposes itself on the plate or film. The camera need only be screwed to a firm tripod and pointed in the direction of the display with the shutter open. The result depends on the time the shutter was open and the number of rockets fired, and there are naturally limits to both of these factors. With a very long exposure the result no longer resembles a firework display at all, but looks more like a pattern of dress material with numerous intersecting lines. Since rockets move very rapidly, the shutter exposure should not be too long in duration. If a shutter speed of  $1/10$ th second is used, it happens at times that the entire track of a rocket is shown on the negative.

In order to get the rockets rising to their full height, it is as well to place the camera a good distance away from them, instead of approaching very near. Fireworks, too, are usually set off over water, and it is good practice to get their reflections in it, for this increases the effect of the picture and livens up the dark shadows. The line of the water's edge will also be shown, and the light will throw up the dark figures of the spectators, both of these facts greatly increasing the interest of the result. The effect of the reflecting surface of the water has an effect on all the shadows, and the exposure time may be somewhat reduced as a consequence.



With a very large-aperture lens, snapshot-exposures of fireworks are also possible. These differ from the time exposure negatives in that they do not show the whole course of the rocket, but a single phase in its progress, such as a shower of sparks just after the head explodes.

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TWO FIREWORK PICTURES. (Right) Panchromatic film: 5 seconds at  $f/3.5$ . (Left) Panchromatic plate:  $1/80$ th second at  $f/1.8$ .



## MOONLIGHT — REAL AND FAKED

By giving a long enough exposure, it is quite easy to take a scene in moonlight, though the result frequently does not resemble moonlight at all. The difficulty is that the moon moves during the exposure, and the shadows move with it, so that after a long exposure it is very easy to confuse the result with one taken in diffused daylight. These troubles may be got over to some extent by including very little sky in the picture, for this always comes out much lighter than it should when a long exposure is given, and the "night" appearance is unfavourably affected.

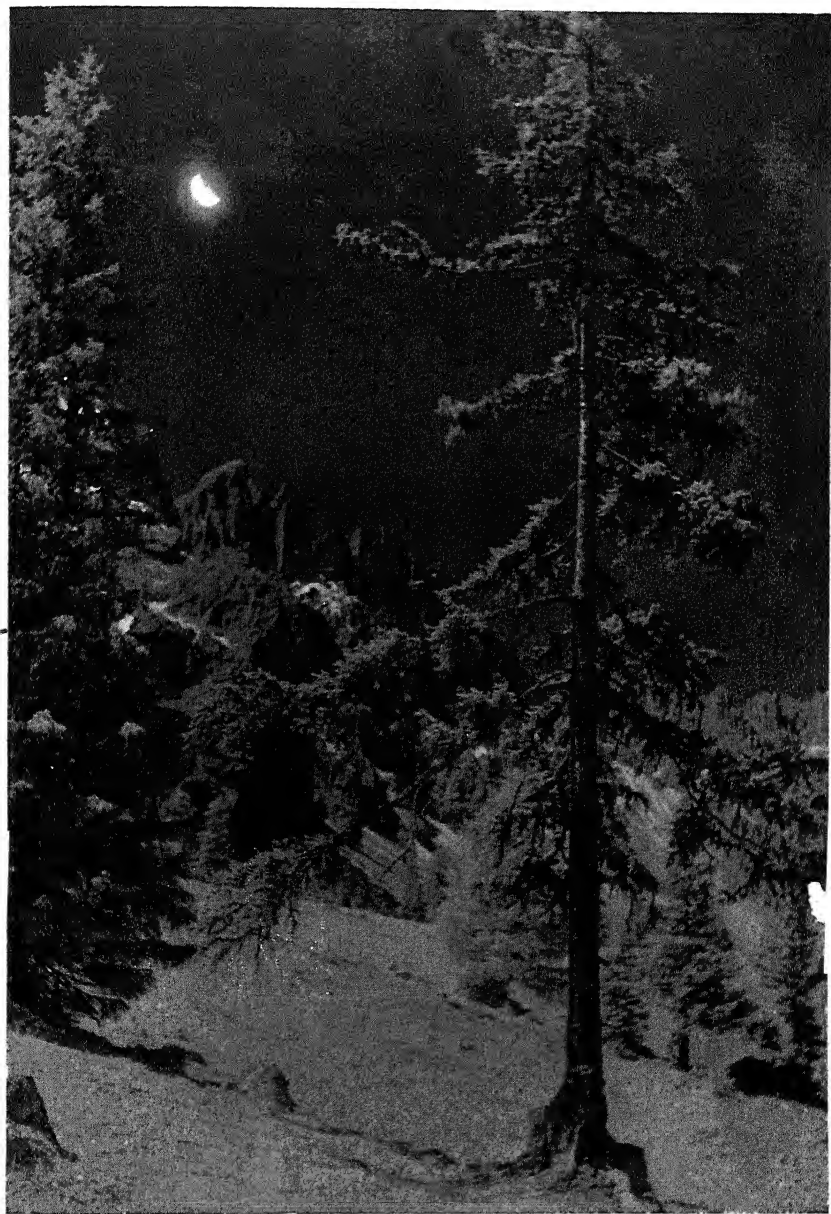
At one time it used to be stated that moonlight pictures should be faked by waiting until the sun was behind a cloud, and then giving far too little exposure. The negative was then over-printed on a contrasty paper to get the impression of moonlight. Nowadays, a better fake results from using a panchromatic plate and red filter—or better still an infra-red plate with an infra-red filter—but the sky must be blue and cloudless for the result to imitate true moonlight.

To include the moon itself in the picture, double exposure is necessary. The moon is photographed at night with  $f/6.3$  and an exposure of about half a second, and the resulting negative placed emulsion to emulsion with a night landscape negative. It is not even necessary to use a special night landscape negative, for many ordinary negatives which have been taken through a filter are quite suitable so long as they are over-printed to give a hard, dark result, while the moon alone remains bright in the sky.

Since the moon is always much smaller in the picture than we imagine it to be, it is best to print it into the picture by using a separate negative even where the landscape scene itself was actually taken in moonlight. For this purpose a negative of the moon is required which has nothing else in the picture, and has been taken with a longer-focus lens than the landscape negative. The two are then enlarged in contact, the larger moon on the moon negative being carefully placed over the smaller moon already present in the landscape negative. The resulting print will appear very much more convincingly natural than the original moonlit landscape negative alone.

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MOONLIGHT IN THE HILLS. Combination of two negatives. The moon negative was on panchromatic film, taken at  $f/6.3$  and  $\frac{1}{2}$  second with a telephoto lens; while the landscape was taken on infra-red film, and was given one second at  $f/9$ .





## RAINBOWS — FAKED AND REAL

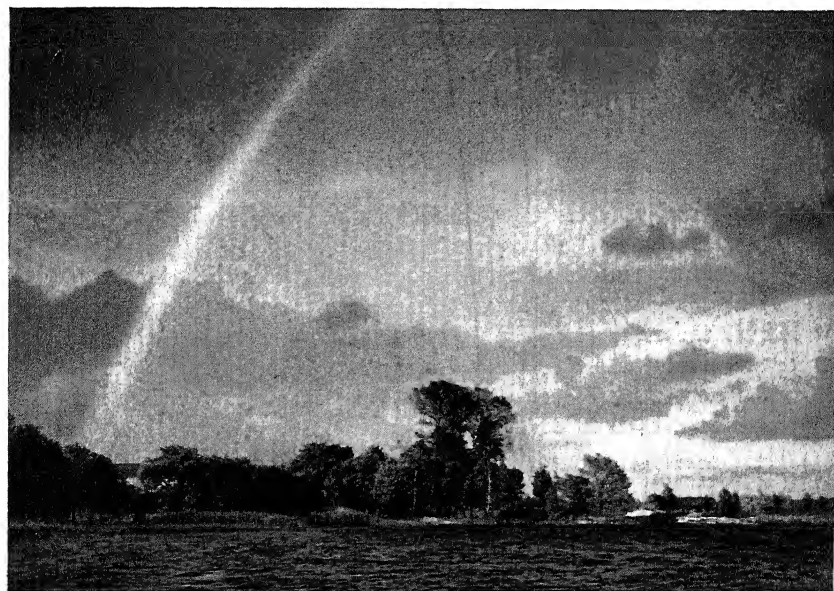
Photographs of an entire rainbow are seldom, or even never, seen. This is due to the optical character of the rainbow, which is an illusion, not a material thing, and is different for each observer. In addition, the rainbow diameter is usually far too wide for it to be shown in full by the camera, even with a wide angle lens, so that though rainbows can be painted by artists they cannot ordinarily be photographed. It is, in fact, far easier to manufacture them afterwards.

Over a suitable negative of a distant landscape which includes a good deal of cloudy sky is placed an unexposed plate or film that has been fixed out, washed, and dried, and the approximate position for the rainbow is determined. Then the bow is drawn with a compass, the pen of which is charged with 2% neococccin solution, and since the point of the compass cannot be allowed to damage the gelatine, it is conveniently placed on a small piece of indiarubber. The arc of the circle is drawn line by line on the emulsion of the blank plate until the desired width of rainbow has been reached, and a second external bow may be included if this is desired. After each line, the dye solution must dry before another can be drawn, and the sharp pen must not damage the gelatine surface. Particular care must be taken here to ensure that the point of the pen does not penetrate the swollen gelatine of the emulsion, for it very easily scratches it. At any point where a scratch occurs, or where the pen enters the gelatine, the result in the print will be dark instead of light. The damage is at its worst where the negatives are printed in a condenser enlarger.

The two plates or films are then placed in the enlarger and printed together. To soften the outline of the bow, the two emulsion surfaces should be a fraction of an inch apart, and a clear glass sheet may conveniently be placed between them. The enlarging lens is used at full aperture, so that when the landscape negative is in focus, the rainbow is unsharp. The more the enlarging lens is stopped down, the farther away from the landscape negative must the rainbow negative be placed.

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RAINBOWS OVER THE RIVER. The upper picture was taken just after a storm, and the drawn rainbow enlarged with it. The lower picture shows a genuine rainbow.



## HOME-MADE SNOWFLAKES

Under suitable conditions, genuine photographs of snowflakes can be made during the daylight hours, by pointing the camera out of an open door or window where the flakes cannot fall near the lens. The exposure time is rather critical, for it must be short enough to reproduce the flakes as such and not as a series of streaks. At night, snowflakes cannot be taken at all, so that a simple dodge must be used.

A few unexposed plates are fixed out, washed and dried. They are then sprayed with a concentrated solution of neococcin from a small scent spray, and since the size of the drops may be varied by altering the distance between spray nozzle and plate, the result will be a number of plates with various sized drops of dye on them.

One of these "snow plates" is then placed behind the negative in the enlarger, the size of the "flakes" being adjusted to the scene on the negative, and the two printed together by projection. In order to avoid the flakes appearing dead sharp, a piece or two of plain glass may be placed between negative and "snow," and when the landscape is sharp the "snow" will be pleasantly diffused. On no account should the negative itself be sprayed, since the result will look completely unnatural.

The glass plates used for the above purpose must be clear and free from bubbles, and it is often difficult to obtain glass of the requisite quality. Their presence has also the disadvantage that the printing exposure in the enlarger must be increased on account of the light they absorb. Thus it is often advantageous to use small wooden strips between the "snow plate" and the original negative instead of glass sheets, and they can easily be arranged to keep the two the proper distance apart. According to the negative in use, they can be placed either across the width or length of the original, and the "snow plate" placed on top.

To get a truly natural effect, the plate with the smallest "flakes" is laid on the negative, with a medium flaked plate over it and a coarse flaked plate over the top again. The flakes in the foreground will then seem to be out of focus, while they will apparently come into focus as the distance from the camera increases to infinity. This same result will be seen in a daylight negative made during a real snowfall.

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THE SNOW KEPT ON FALLING. The night exposure was made just after a heavy fall, at f/8 with one minute exposure on panchromatic film. Two snow plates were used during enlargement.



## VISIBLE RAYS OF THE SUN

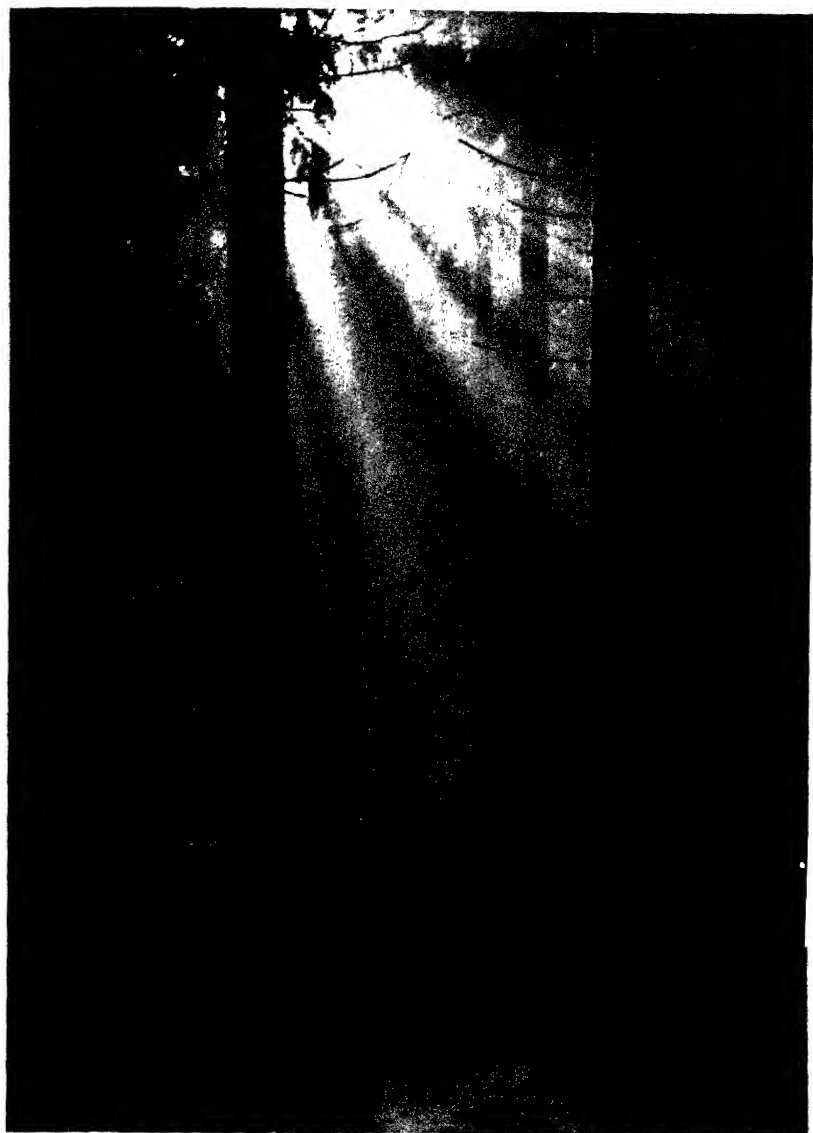
Under suitable weather conditions, certain light effects can be photographed which — although they appear quite impossible — are genuine unretouched photographic records. In Spring and Autumn, mist is often found in low-lying places, and such mists disappear only late in the morning. When the weather conditions remain more or less constant, there are frequently a number of days running on which remarkable light effects can be photographed without much trouble.

The important point to observe is that the mist should only lie low on the ground, and that the sky above should be quite clear, in order that the sun itself can pierce the mist from above. This condition only lasts a short time, so that the camera must be ready in the early morning, and a watchful eye kept on the position of the sun so that it is always just hidden behind a tree-trunk. As soon as the upper layers of mist have dispersed, and the sun streams down through the lower ones, the exposure must be made at once, for in a few minutes the sun will disperse all the mist and the chance of a good result will have gone. The best counsel for the photographer in this field of work is that of endless patience, even if it takes days — or even years — to get the weather conditions absolutely right for the exposure.

It is important that the sun should not appear more from one side of the tree-trunk than the other. Apart from halation, the weaker rays from the one side which will result if the sun is not centrally placed would give too little exposure to the shadows. A non-colour-sensitive negative is necessary if the mist is to be accentuated, and panchromatic material is out of the question. Proper protection from halation effects is also essential. Exposure should be full, because of the contrast of the subject, and development should be soft. If no details appear in the shadows a false impression of the scene is given, and the mist effect is spoiled. Those who always have panchromatic film in a roll-film or miniature camera should use a blue filter for mist exposures, since this has the effect in daylight of changing the panchromatic sensitivity into orthochromatic sensitivity, and we have seen above that the latter is an essential for mist effects.

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THE SUN BREAKS THROUGH. February, 9 a. m. f/9 —  $\frac{1}{25}$ th second exposure. Orthochromatic plate.



## GLEAMING LIGHT-BEAMS

If a beam of light is thrown into the dim atmosphere of a church, particularly if incense has been burning, its path can usually be seen by the gleam of the small dust particles which it lights up. The attractive effect of such gleaming light-beams is well known, and dust and smoke are very useful to the photographer since they introduce a touch of fantasy into an otherwise naturalistic picture.

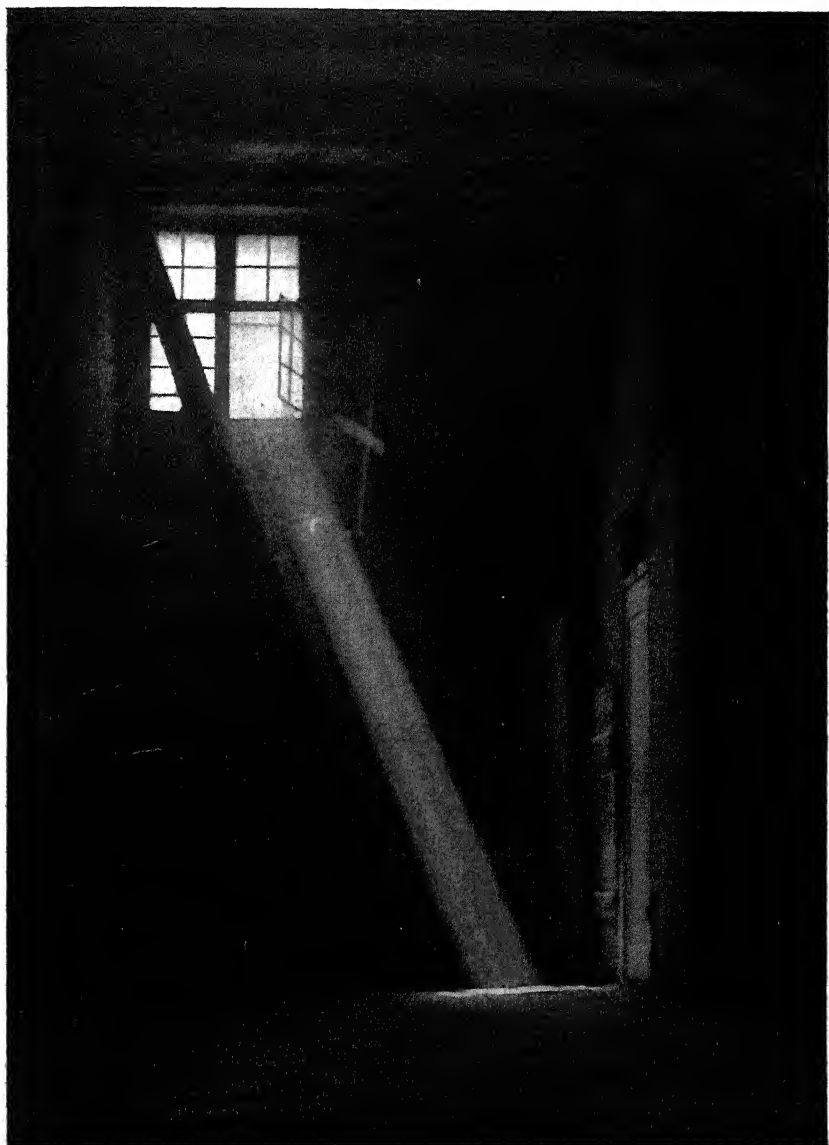
It is not always possible to photograph either these beams or other forms of smoke or steam (such as from a steaming kettle). Smoke, however, can be introduced artificially into the room by burning a special powder. The effect given is much stronger to the eye than either pipe or cigarette smoke, and is very suitable for the camera. The powder consists of 2 parts (by weight) of finely powdered sal ammoniac, intimately mixed with 10 parts of milk sugar and 15 parts of potassium chlorate. Care should be exercised during the mixing, as the chlorate easily takes fire. The powders should not be rubbed roughly and without caution, and on no account should the photographer smoke while mixing them. If these precautions are adopted, there is no risk of fire or explosion during the process. After mixing, the powder can be kept in a well-corked glass bottle or tin box for any convenient length of time.

The powder is lit by a match, spread out in an open tin, but it can also be ignited in an electric flash-lamp from a distance if this is more convenient. To avoid any risk of an explosion, the powder must be thinly spread over the area of the tin, and not be piled into a heap. As soon as the powder has started burning, no time must be lost, and the exposure must be made immediately. While it is true that this powder burns nothing like so rapidly as flash-powder, the most attractive effects are only obtained just after it has been lighted.

Those who do not object to the rather unpleasant smell this powder produces will find the results given are excellent. Burnt in a kettle or in the hearth some most attractive pictures can be obtained, while it may also be used in the kitchen or wash-house with good effect. Care should be taken that polished metal is not present, since the smoke from the powder will deposit on it.

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INCENSE CHAMBER IN A MONASTERY. Folding camera and orthochromatic plate.  
f/6.3 — 30 seconds exposure.





## SMOKE-RINGS

In order to photograph the swirls of tobacco smoke in their many forms, two conditions must be fulfilled. In the first place, the light must make the smoke visible, and in the second a short exposure is necessary to "stop" the movement. A dark shadowed background will naturally show up the smoke best by contrast.

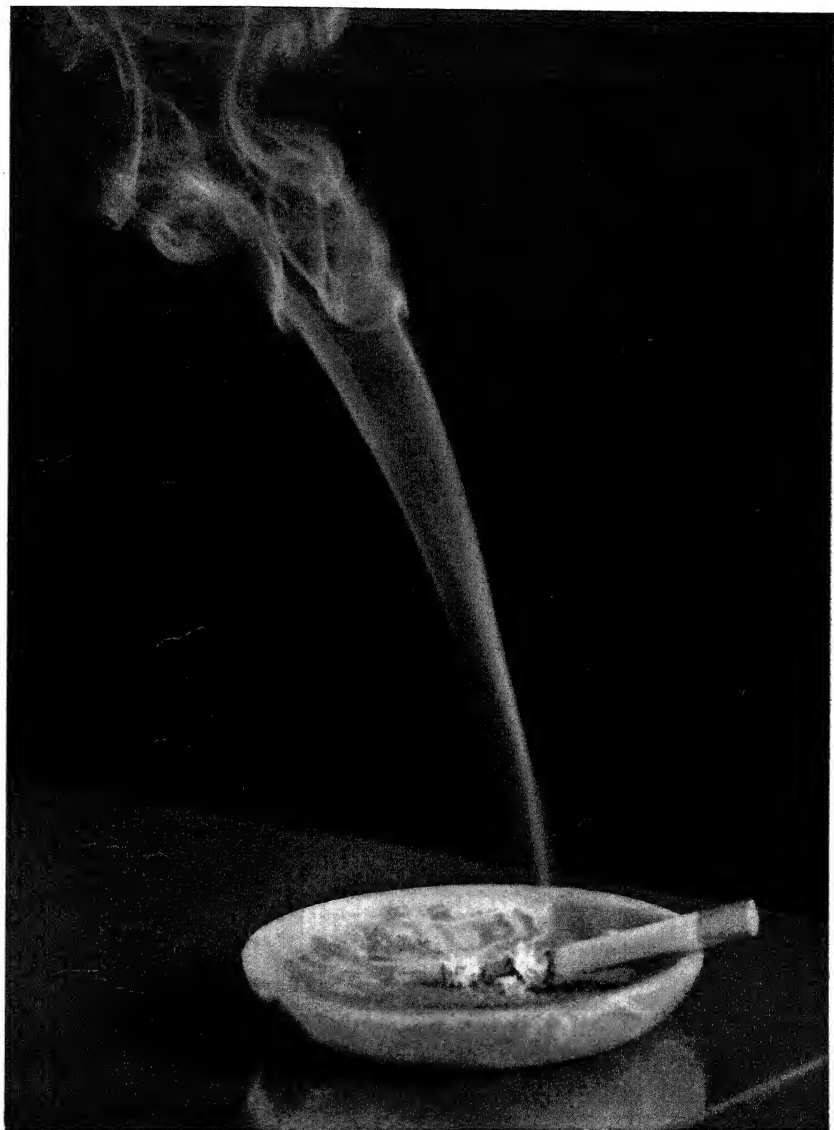
In sunshine and daylight generally, it is sometimes possible to get fairly good smoke pictures, but these conditions are not really the best, for the lighting cannot be suitably adjusted, and when the sun shines into a room the air is not really still. Flash powder is no use, since the explosion of the flash causes a wave of air pressure, and immediately destroys the smoke figure. Artificial light is not very satisfactory either, since it is seldom strong enough for the lens to be sufficiently stopped down, and there only remains the flash-bulb, which gives a short exposure time and a considerable light intensity.

These bulbs must be used in a reflector, and placed so that the light comes obliquely from high behind the smoke, while it is best to use a dark background against which the coils of smoke will show up in greater contrast. After setting up the camera all the doors and windows in the room must be closed, and the lighted cigar or cigarette put into position. Then one must wait till the air has stopped moving — which means that the photographer must sit or stand still for a minute or two—after which the shutter is opened on the "bulb" setting, the flash-bulb fired, and the shutter closed again. On no account should the motions of making the exposure or firing the flash be carried out roughly or rapidly, or further air currents will be set up and the smoke coil will be blown away.

If a spot-lamp is available it may be used in a similar way. The light must still fall from high behind the smoke, and with a large-aperture lens a short exposure can be given. Since the spot throws very hard and dark shadows, the latter must be lit by a small lamp near the camera. The negative must not be developed too soft, since the smoke should be as dense as possible.

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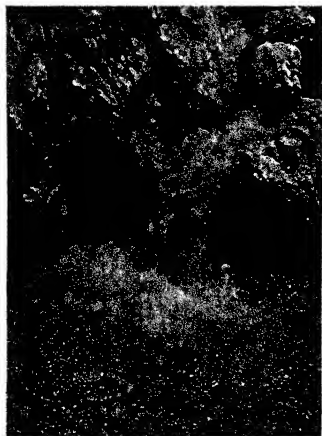
THE SPIRIT OF NICOTINE. Folding camera and orthochromatic plate. *f*/9 with a single small flash-bulb beside the camera.



## RUNNING WATER RIGHT AND WRONG

The slow movement of running water or dancing waves makes it possible to record them in a stationary phase with an ordinary snapshot exposure, but the resulting picture usually looks dead and rigid. It not infrequently happens that the water in snapshot exposures looks more like glass or ice, just because there is no impression of movement. A photograph of rolling waves—which travel very slowly—can sometimes appear very attractive if sufficient sea and a large number of waves are included in the picture to give the impression of motion by repetition and rhythm, but to isolate a single wave on the negative merely means that the result will be glassy and still.

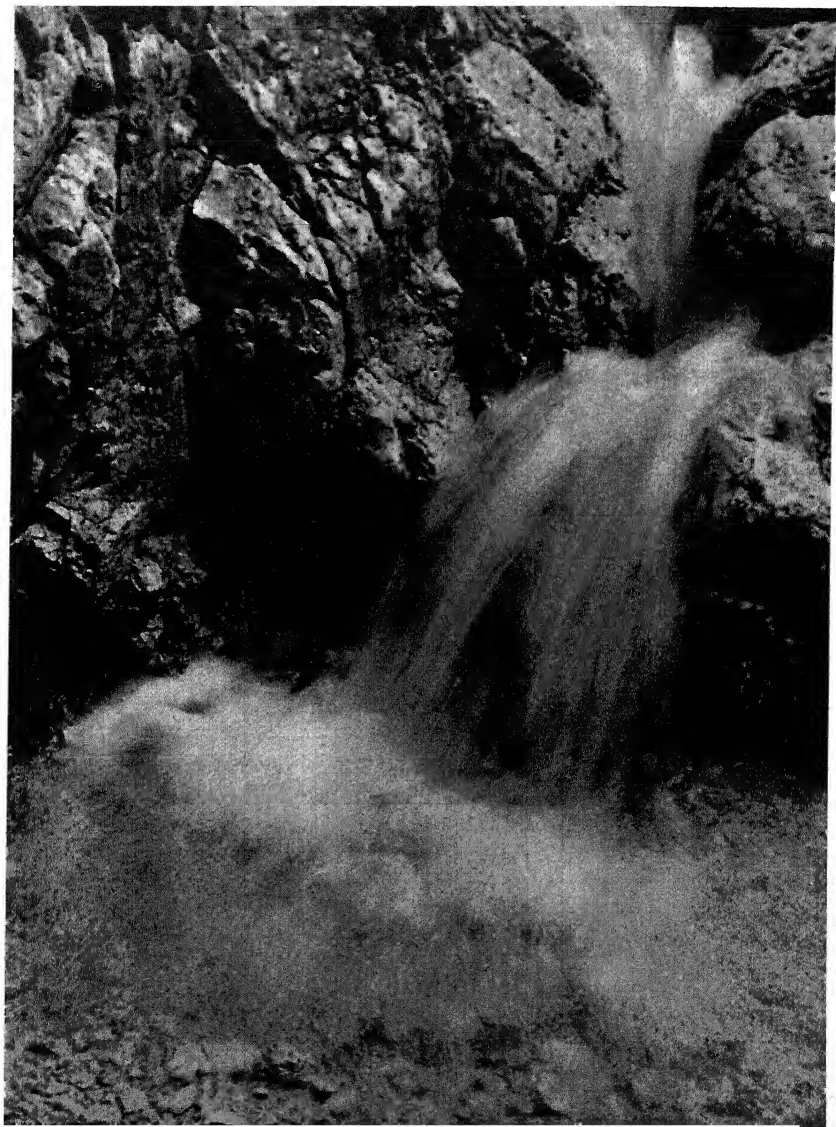
Even more care is necessary with rapidly moving water, as is seen in the two illustrations. The first was taken at  $\frac{1}{300}$ th of a second, and shows a single phase in the movement of the falling water which the eye could not appreciate. The second—taken at  $\frac{1}{10}$ th of a second—gives a natural impression of the waterfall. The conclusion to be drawn from the two is that short exposures are unsatisfactory in this case. It may be that some readers consider the right-hand picture is blurred. This is perfectly intentional, because nobody will say that the lower picture gives them the impression of flowing water that is produced by the slight lack of sharpness in the picture on the right. — The same is true when photographing trees



in stormy weather, or cornfields waving in the wind. A stormy landscape is characterised by the waving tree-tops, and if a short exposure is given it will merely look as if they had all grown obliquely. Only a slight lack of sharpness to indicate movement will give the true effect of a storm. Here is a very important point: blurred outlines — when introduced intentionally — have an actual value from the pictorial point of view, particularly when they are well contrasted with completely stationary and sharply defined objects in the same picture.

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**WATERFALL.** The picture above shows a single phase taken at  $f/4.5$  —  $\frac{1}{300}$ th second, while that in the right was given  $\frac{1}{10}$ th second at  $f/16$ .



## A DROP DROPS

There are a number of simple subjects which—though not in the least sensational in themselves—are by no means easy to photograph. If glass itself is often difficult to reproduce naturally, there are a number of objects of similar character which are moving and thus introduce still greater difficulties. It is not at all easy to photograph a stream of water, whether it falls from a tap or is sprayed from a hose, for in both cases the movement is very much more rapid than the eye leads us to believe. In any case, we are not used to seeing moving water in a “static” state. The impression the eye receives is of dynamic movement, and it is with this impression that our conception of “flow” is connected, even if the actual connection is not conscious in our minds.

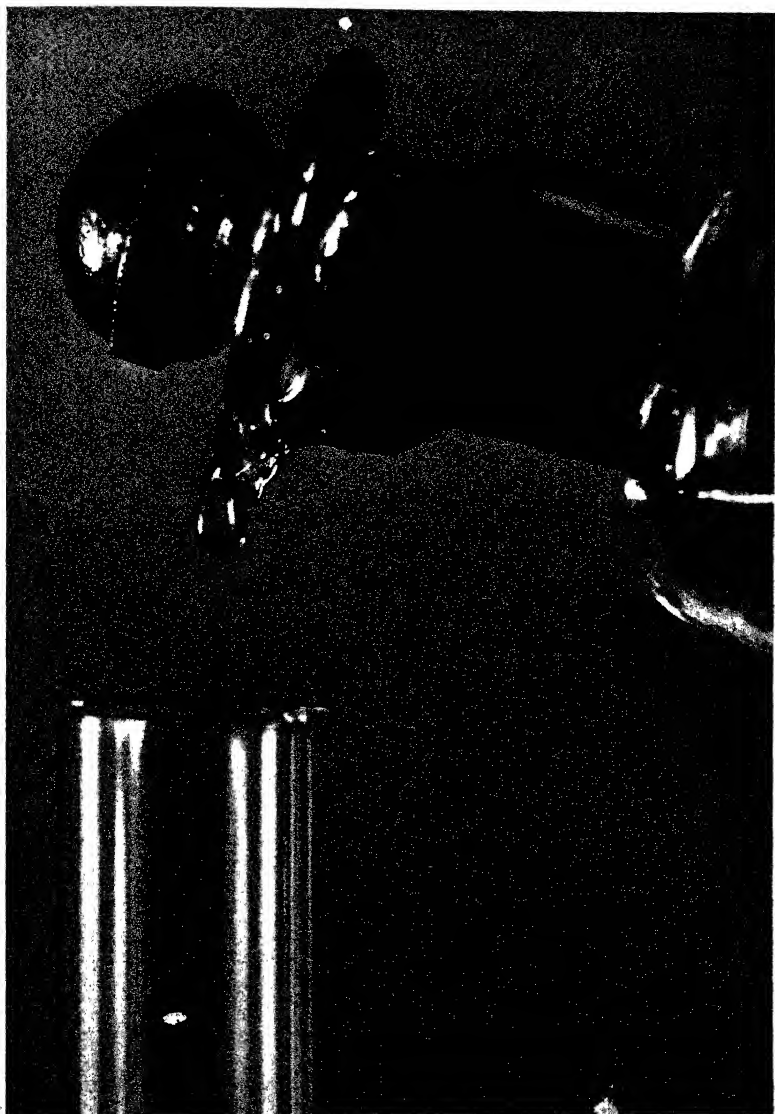
Back-lighting, which reaches the camera through the water, is necessary to get any result at all, and a dark background is always very valuable. To get the correct reflections from the water and to show its transparency it is essential that aluminium reflectors should be at hand to produce high-lights in the right places. Only such high-lights can show the true shape and character of the water, for water is colourless and transparent, and it is only by optical phenomena that we discern its presence at all. While we see through water, we equally see the surrounding objects reflected in its surface.

A small drop, falling from a glass tube or the point of a needle, is a stringent test of any photographer's patience, and to get anything like a satisfactory result it is much better to beg the question and use a more viscous fluid in order to slow down the formation of the drop. Glycerine or a solution of gum tragacanth in water are both suitable, and a particularly simple way of going about the work is to use a solution of gelatine in warm water. By taking the solution into a cold room the drop will “freeze” almost to solid gelatine, and the exposure can be as long as desired. With flowing solutions daylight or a flash-bulb will be required, particularly if it is desired to catch the drop just before it falls.



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MAKING UP A DOSE. Studio camera and panchromatic film.  $f/9$  — 3 seconds exposure, with two Nitraphot lamps and three aluminium reflectors.



## CURRENTS YOU CAN SEE

If two streams of air meet each other from different directions, a series of currents is formed which may take the most varied of shapes. These currents are unfortunately invisible, since air is transparent. The same thing happens in water, but in this case the currents can be made visible by the use of coloured solutions and a glass tank.

The tank can easily be made up out of old glass plates from which the emulsion has been removed. A U-shaped wooden frame is first made, and two glass plates glued to it with canada balsam, sealing wax, or some other suitable substance, to form a narrow glass-sided tank. The narrower these tanks are made, the easier it is to focus and to get the requisite depth of focus, but the tank must not be made so narrow that the free circulation of the currents in the liquid is hindered.

The tank is then filled with water and placed in front of the "effects box" described on page 112. If no effects box is at hand, a square cardboard box may be used in its place if its inside has been carefully blackened. A ground-glass screen is then placed on the far side of the tank from the camera, and a flash-lamp set behind it. The order is then: camera, cardboard box, tank, ground glass, and flash-lamp. Those who have no great experience should use a sheet of thin opal (or flashed opal) glass instead of the ground glass, since this makes it very much more easy to distribute the light evenly over the area of the tank face.

When everything is ready, and the lens is sharply focussed on the tank, a dye solution—such as coloured ink—is poured into the tank from above. According to the manner in which the ink is poured, dropped, or sprayed into the clean water; according to the shape and width of the tank; and according to the concentration and direction of flow of the dye solution, the most varied effects may be obtained. Further variations can be made by using such liquids as glycerine, methylated spirits, or petrol instead of water in the tank.

Since the photograph is taken against the light, it is usually necessary to use a filter of complementary colour to the dye solution in order to get sufficient contrast.

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INK POURED INTO WATER. Studio reflex camera and orthochromatic film.  $f/8$  —  $2\times$  yellow filter, with half a gram of flash-powder.





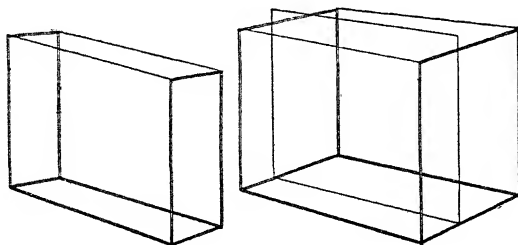
## LOOKING UNDER WATER

Neither camera nor photographer can dive under water to take photographs, so that an aquarium has to be used for photographs of fish and under-water life generally. Even so, the work is not very easy, for an aquarium is usually quite large and its occupants very lively. They rush round and dash from back to front, making the focussing extremely difficult.

There are two ways of getting out of this dilemma. In the first, a special photographic tank 15×12 inches high and broad, but only 4 inches from back to front, may be used, and in the second, an ordinary aquarium may be partitioned off by a glass sheet so that its inhabitants have only a space of 4 inches from front to back in which to move about. This makes sharp pictures comparatively simple, and the camera is set up so that the entire front surface of the aquarium is within its field. The fish are then free to move about (so far as the camera is concerned) and the exposure can be made at any time when they happen to be in suitable positions. If the focussing has been properly arranged and the glass partition correctly placed, there will be no question of them being out of focus.

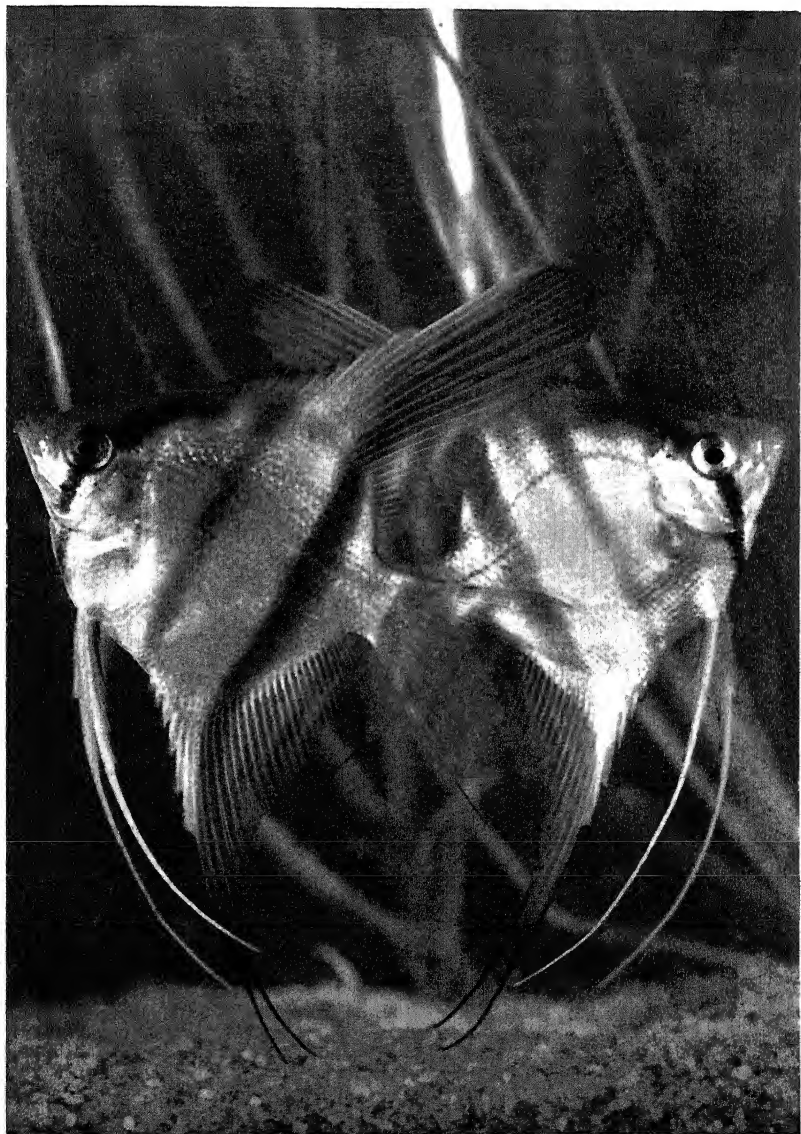
The question of the background is of considerable importance: to get the true silvery tones of the scales of the fish a black background as a complementary colour is usually necessary. Where dark-coloured fish are in question, too, it is far more satisfactory to use a light grey background rather than a pure white one. The grey background will accentuate the shining high-lights on the fish very much more pleasingly.

The more lively the fish, the shorter must the exposure be. It is best to make a trial negative and develop it first, so that waste is avoided.



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ANGEL FISH. Studio reflex camera and panchromatic film.  $f/8$  — one gram flash-powder. Taken in a special tank.



## ANIMALS BEHIND BARS

Even if animals are often enclosed in quite small cages or enclosures so that they cannot run about in their natural way, it is usually necessary to make use of one or two dodges to get good photographs of them. The main point is to show the animals alone, without a barrier of posts or wire netting.

In the first place, care must be taken that the netting between camera and animal does not show on the negative, and this is comparatively easily done by using a long-focus lens or holding the lens between the mesh of the netting. The wires, however, will throw shadows, and if stripes of light and shade or patterned shadows fall on the animals the result will be unpleasant. The sun should thus be in the correct position where the netting or bars throw no shadows inside the enclosure.

Where it is not possible to hold the camera close to the enclosure, another point arises. The sun may be reflected from the mesh of the netting and the latter produce a sort of soft-focus effect on the negative. The effect is more pronounced as the mesh of the netting is finer, and it is thus necessary to make sure either that the sun does not strike the latter or that it is in shadow. Since it is seldom satisfactory to photograph with the sun behind the camera, the hand should shade the netting during exposure. (If the sun gets behind the camera the modelling will usually be unsatisfactory.)

The background also needs careful treatment, for posts, bars, and netting can ruin the picture. A long-focus lens certainly helps greatly here, assuming that a fairly large aperture is used, and the woolliness of the background will then accentuate the sharp outlines of the animals themselves. The position of the sun must be watched very carefully: at some particular hour the background will either lie in deep shadow or else be brilliantly lit. In either case the effect is just as one could desire it.

To get as natural a picture as possible, animals should only be photographed in positions which they take up in real life in the open, and patience is an essential for the zoo photographer. It is much better to take a single good picture of an animal than ten indifferent ones in the same time.

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PELICANS. Quarter-plate reflex. Telephoto lens at  $f/6.3$  and  $\frac{1}{50}$ th second on a sunny day. Note the diffused focus of the background.



## ANIMALS IN THEIR NATIVE HAUNTS

Natural history is a field of photography in which many highly competent specialists work, and hunting with the camera needs a great deal of experience, though this should not debar anyone from attempting the work provided that he is not afraid of failures or of the necessary patience and trouble involved. Reptiles, frogs, snakes, and other small animals present no special difficulties even to the inexperienced, and they are excellent subjects on which to gain practice in nature photography.

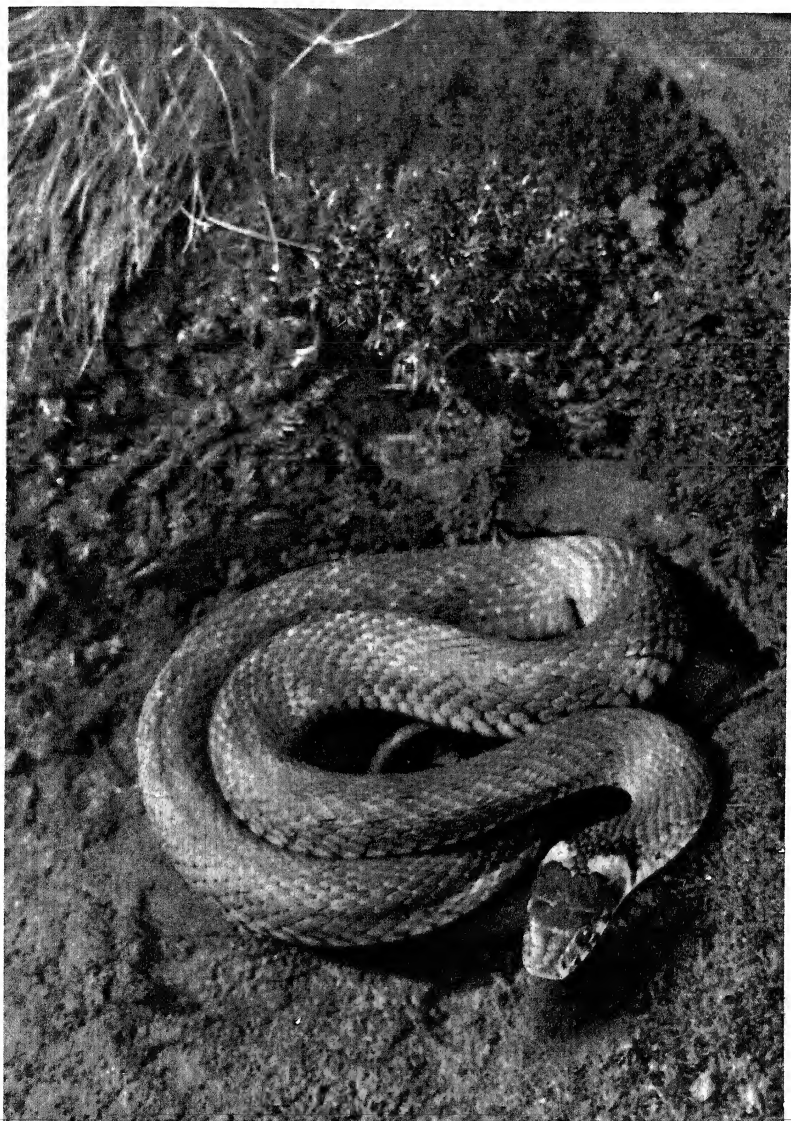
The most important qualification of the beginner in this field is a complete confidence in his camera and its technical movements, so that a picture can be taken at any given moment without any difficulties in setting it correctly. The shutter must be ready for the exposure at the most suitable moment, and no adjustments should be required at the last minute, for a rapid movement of the hand will scare the quarry right out of the picture. The results depend very much on the personal attitude of the photographer to his subjects — much more so than on his technical ability with the camera.

Birds, too, are not very difficult to photograph if a few precautions are taken. A feeding-place is spread daily with grain and a perch set up on which the birds can alight. To get them used to the presence of the camera, a dummy is set up in the position it will subsequently occupy, and the real camera put in its place after a few days. A string is tied to the shutter release and the photographer goes into hiding to wait for his guests. Since it not infrequently happens that a good deal of time will elapse before the exposure can be made, a black cloth should be placed over the camera back so that the slit from which the slide of the plate-holder has been withdrawn is protected from light. This precaution saves fogging.

To get good pictures in national parks, reservations, and the like, it is best to get in touch with the foresters first of all, since they will be able to say at what part of the park animals are most likely to be encountered. In all cases of photographing wild life, experience in field work is more important than photographic knowledge, and the capacity for slow and quiet movement is essential. Inconspicuous clothing should be worn, and shoes should be soled with rubber. Smoking is naturally out of the question.

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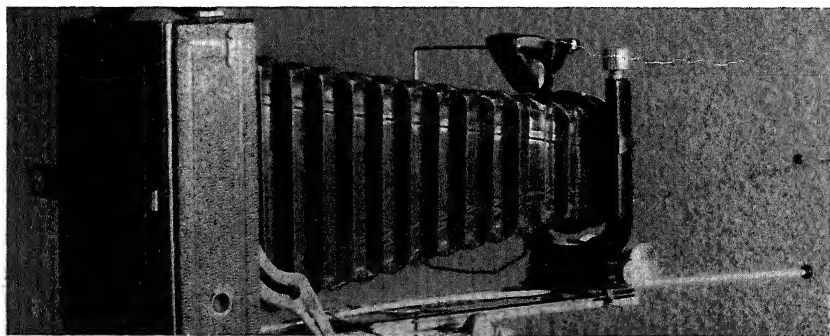
GRASS-SNAKE. Quarter-plate folding camera and panchromatic plate.  $f/6.3$  —  $\frac{1}{20}$ th second exposure. Diffused sunlight.



## HOW TO SNAP AN INSECT

For successful photographs of insects, a special camera is not essential. So long as the existing camera has sufficient double extension to get a large enough image, it may be used without much alteration. One method of work is to set up the camera with the bellows extended as far as possible, and focus it on a single flower. If a flower is chosen which stands practically alone in a field, insects will soon appear on it, and at any suitable moment when the wind has dropped the exposure can be made. It is not necessary here to construct a "hide" to escape notice. Provided that one keeps still, there is nothing against sitting or lying down by the flower and holding the camera ready.

A second method gives greater freedom. The camera is extended as far as possible, and focussed on the head of a drawing-pin on the wall by moving the entire camera backwards or forwards until the image is sharp. A thin piece of wood, or a knitting needle, is then attached to the base of the camera (see illustration below) to indicate the distance from the camera at which objects are sharply focussed. After noting the distance of the wood or needle from the optical axis of the lens, the camera can be taken out of doors and it will only be necessary to bring it up to a flower on which an insect is resting so that the end of the wood (or needle) is in the same plane as the latter. The device is a sort of combined finder and focussing attachment for very short distances. In order to avoid the shadow of the pointer being thrown on the subject, the camera must always be turned so that the it is on the far side of the subject from the sun.



A WASP VISITS THE CORNFLOWERS. Folding plate camera and panchromatic plate.  $f/9 - \frac{1}{25}$ th second exposure. (Enlarged.)





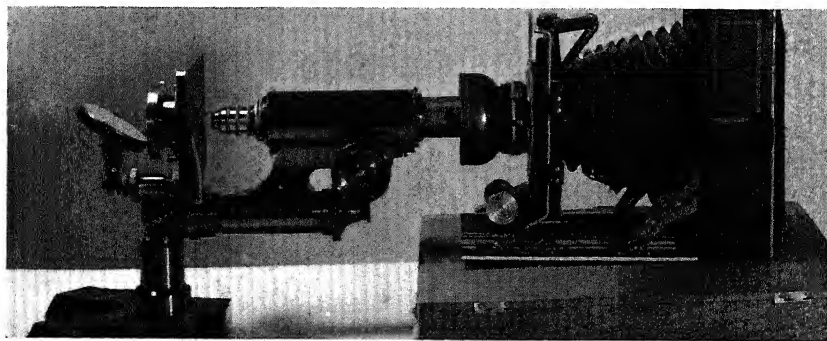
## A WORD ABOUT THE MICROSCOPE

In photography we usually make small pictures of large objects, but in photo-micrography the position is reversed, for the largest possible picture of a small object is wanted. The work is by no means difficult, so long as extreme enlargement is not wanted: magnifications between 20 and 40 diameters (which are quite considerable) are possible with a simple microscope and an ordinary camera.

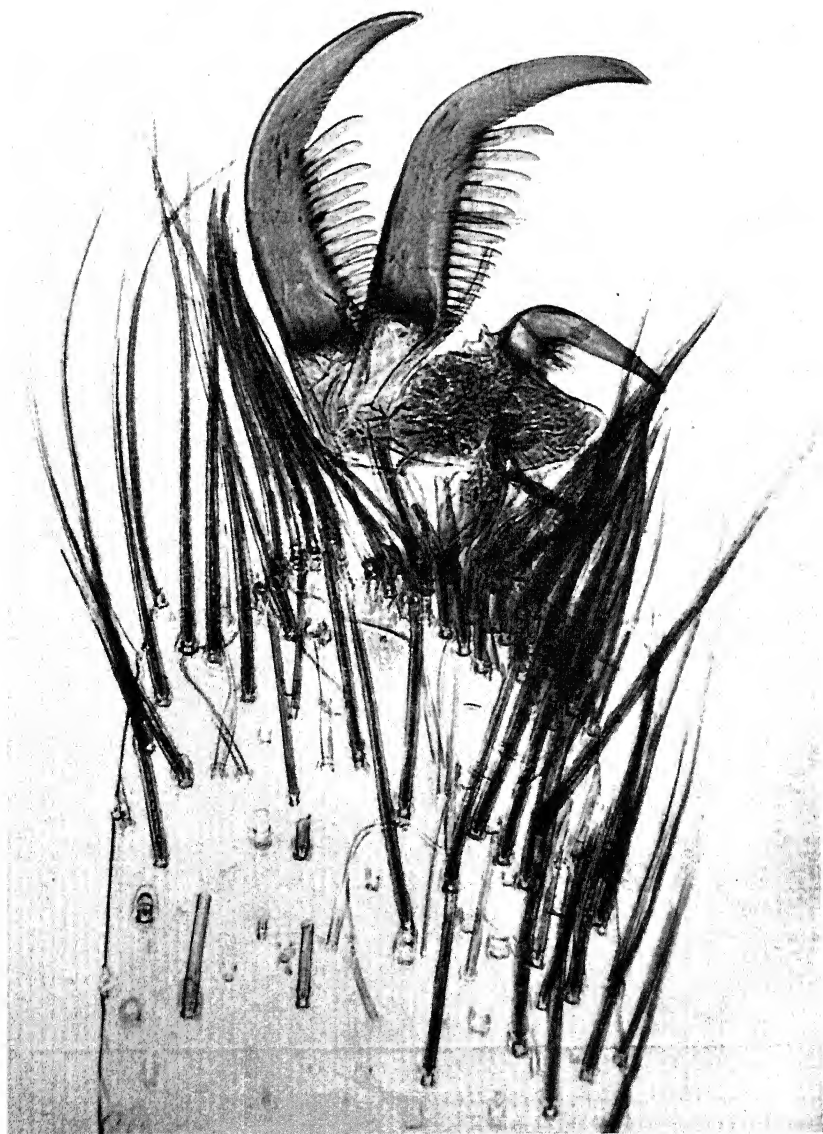
After preparing the slide, the camera is pushed up to the eyepiece of the microscope until no other light can reach the plate or film but that from the microscope itself. (This may be done by covering the junction of the two with a black cloth or putting a rubber tube over the two.) The image is then focussed on the ground glass, and a trial negative made to see how long an exposure is required.

A fully anti-halation orthochromatic plate is necessary, and since the subject is seldom contrasty the negative should be developed hard. Metol-Hydroquinone solution diluted 1:1 is suitable. To increase the contrast still more, the light should be passed through a filter of complementary colour to the specimen before it reaches the latter. Thus, a specimen that was red in colour could be used in conjunction with a filter that made the light deep green before reaching the microscope stage.

Microscopic preparations can also be photographed by putting them in the negative carrier of a miniature film enlarger, and using a lantern plate on the easel below. The only danger here is that the heat from the enlarging lamp may damage the preparation in the carrier.



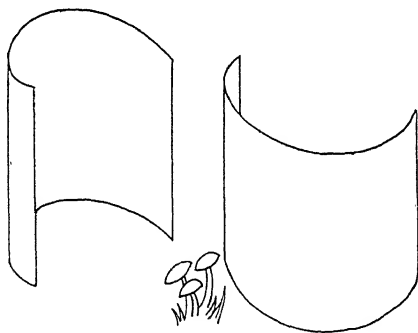
FOOT OF A SPIDER. Taken with a simple microscope and an ordinary camera. Orthochromatic plate.



## REFLECTORS ON RAMBLES

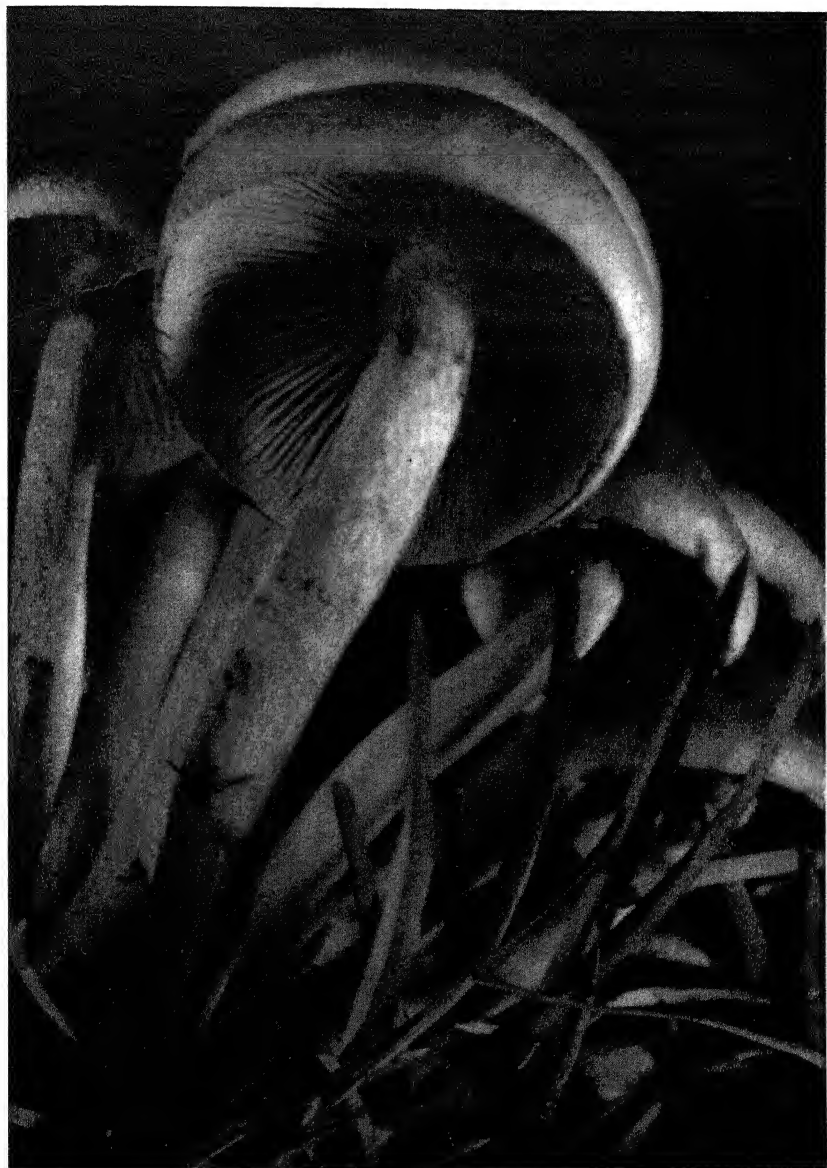
Motion picture cameramen have used reflectors out of doors for many years now, in order to get the lighting as they want it, and reflectors are commonly used indoors in artificial light. Unfortunately, few photographers remember the value of reflectors outside, where they will on some occasions work wonders. It is true that a photographer can hardly wander round the country with a large mirror, but there is no difficulty in using aluminium-faced paper that is rolled round into a tube and pushed over the tripod legs. The reflector can conveniently be stiffened by coating the back with black paper, and two reflectors instead of one may be found even more useful. The second reflector can then be coated with grey paper on the back, in order to have a neutral background at hand when it is needed. White paper is neither useful as a background nor as a reflector: for the latter purpose it gives a weak, diffused, and unsatisfactory light.

There are a large number of small objects which can be very happily dealt with by these means. Small flowers, mosses, toadstools and many other plants that are found in dark woods can be brought to the "light of day" with the reflector. One reflector is unrolled and used to concentrate light on the subject: the less the sheet is unrolled the more intense and contrasty the lighting. The back of the second reflector will serve as an excellent neutral background and will stop unwanted objects spoiling the effectiveness of the picture.



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TOADSTOOLS. Quarter-plate camera and orthochromatic plate.  $f/12$  — 1 second exposure. Note the value of reflected light.



## TAKING FLOWERS WITHOUT TROUBLE

If photographers could alter natural laws to make a better job of their work they would certainly do so before making an exposure, but as things are, the best they can do is to choose the camera position to give the best effect possible. It happens that under some circumstances it is possible for pictures to be composed almost as variedly as we want them to be, and one particular field in which this can be done is the photography of flowers.

At first sight it would seem that flowers can be photographed like anything else, but a few trials will show that they are very trying to deal with. First of all the flowers must be composed, and they will certainly never stay in their places as intended. A leaf brings the foreground out of focus to start with, and as soon as this is dealt with the flowers cover each other and hide their beauties. To keep them in their right places, a jam-jar is filled with sand and a piece of wire-netting fastened over the top. By pushing the stems through the mesh into the sand, they will stay where they are put.

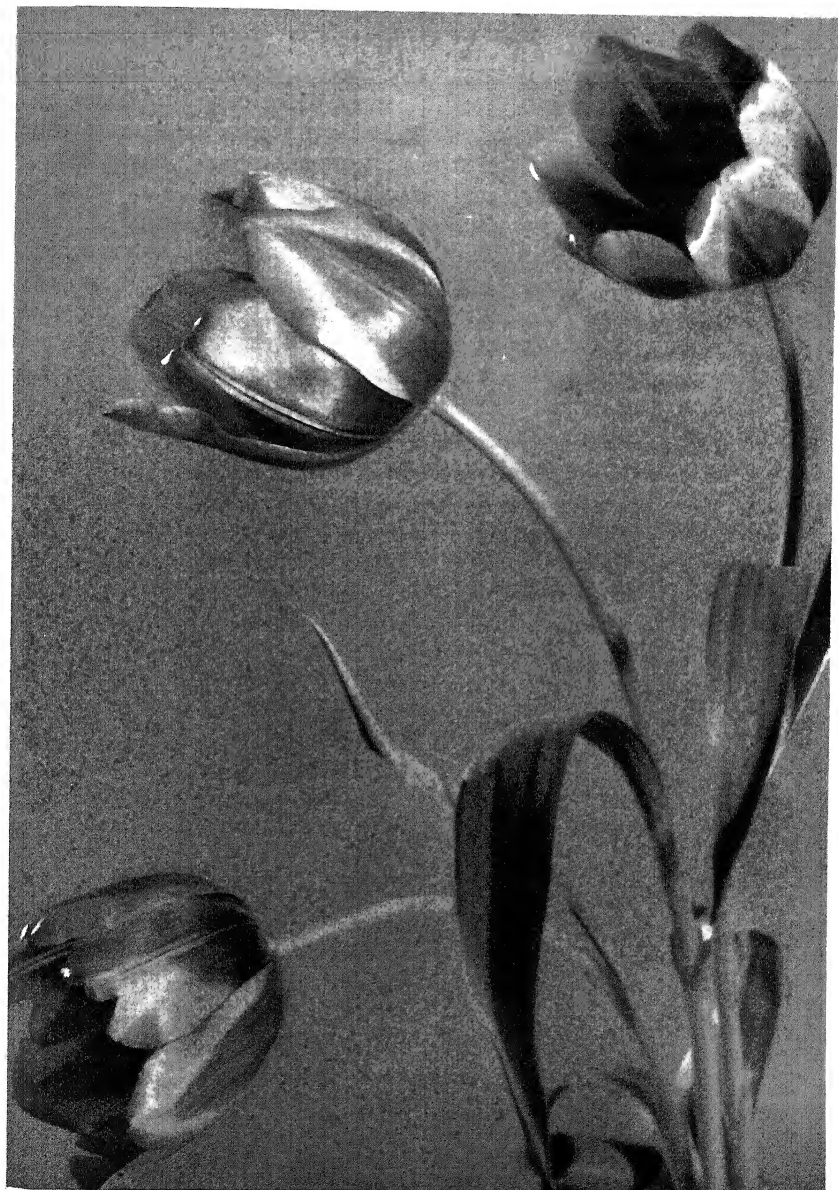
Many flowers are very susceptible to heat, and wilt during the exposure. In such cases the jar must be filled with water after the flowers have been put into the sand. Fleshy leaves may be kept in place by running thin wires up them, and bending the wires brings them into the desired position. At all costs the lamps should be kept well away from the flowers, and focussing with the lamps burning should be done as rapidly as possible. The heat given out by even a small lamp will very soon start the flowers drooping and withering, and it is very much safer to keep the lamps as far away as possible, in order to reduce the amount of heat reaching the flowers, and to give a longer exposure.

At other times it is not possible to light up the interior of a flower to show all the detail there. Small pieces of tin about 3 inches square, attached to wires and used as miniature reflectors, will help to light up the part of the flower that is too dark.

The most important problem of all is the choice of a suitable background, which must contrast with the flowers as well as with the leaves. For a small sum a series of tinted cards can be obtained from an art dealer, and from these one can always be found that will be satisfactory.

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TULIPS. View camera and orthochromatic film.  $f/18$  — 12 seconds exposure, with a single Nitrophot lamp and three reflectors.



## The CHRISTMAS-SPIRIT

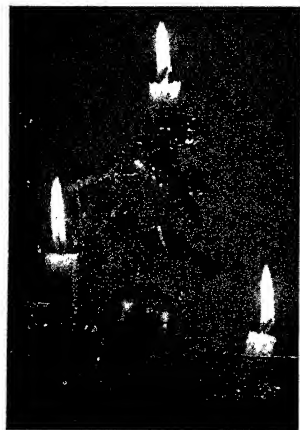
If photography is much influenced by the work of painters, the art of painting has received a good deal in return. Not only has photography introduced to it the idea of recording selected phases of movements, which were unknown before snapshot exposures came into being, but a number of purely photographic phenomena (such as halation) have also been enthusiastically adopted by other branches of art.

There are a large number of Christmas cards shown in the stores during December, and round every candle appears a circular ring of light which the photographers call halation. This ring is rarely visible to the naked eye, and painters and artists themselves, even if they cannot say exactly why they put it in, always assert that it is part of the spirit of Christmas—which is hardly incorrect.

Photographers also have to make Christmas pictures, and since candles and Christmas trees are not enough to produce a truly seasonable effect, other pictorial effects must be devised for emphasis. The idea of gleaming lights in a warm dim room provides the answer to the problem. The intensification and emphasis must be laid on these points to get a good pictorial result, and suitable means must be devised to produce them. Thus halation, which is usually kept down to its lowest limits, must in this case actually be encouraged to show the reflected gleams of light. A contrasty unbacked plate will produce a truly Christmas spirit at its best.

The longer the candles are exposed, the greater the halation and the more "gleam" appears in the print. Since "ring" halation only appears on plates films cannot be used.

A good soft-focus lens is a great help in producing the effect of gleam and shining lights, though it must be used with caution because it is inclined to lighten the shadows too much. The soft-focus effect must thus not be carried too far, while the exposure must be short and the negative given contrasty development.



CHRISTMAS CANDLES. These two comparative photos were made under the same lighting conditions. (Right) Slow unbacked process plate with  $f/9$  and 30 seconds exposure. (Left) Fast backed panchromatic plate with  $f/9$  and 6 seconds exposure.





## AT THE FIRESIDE

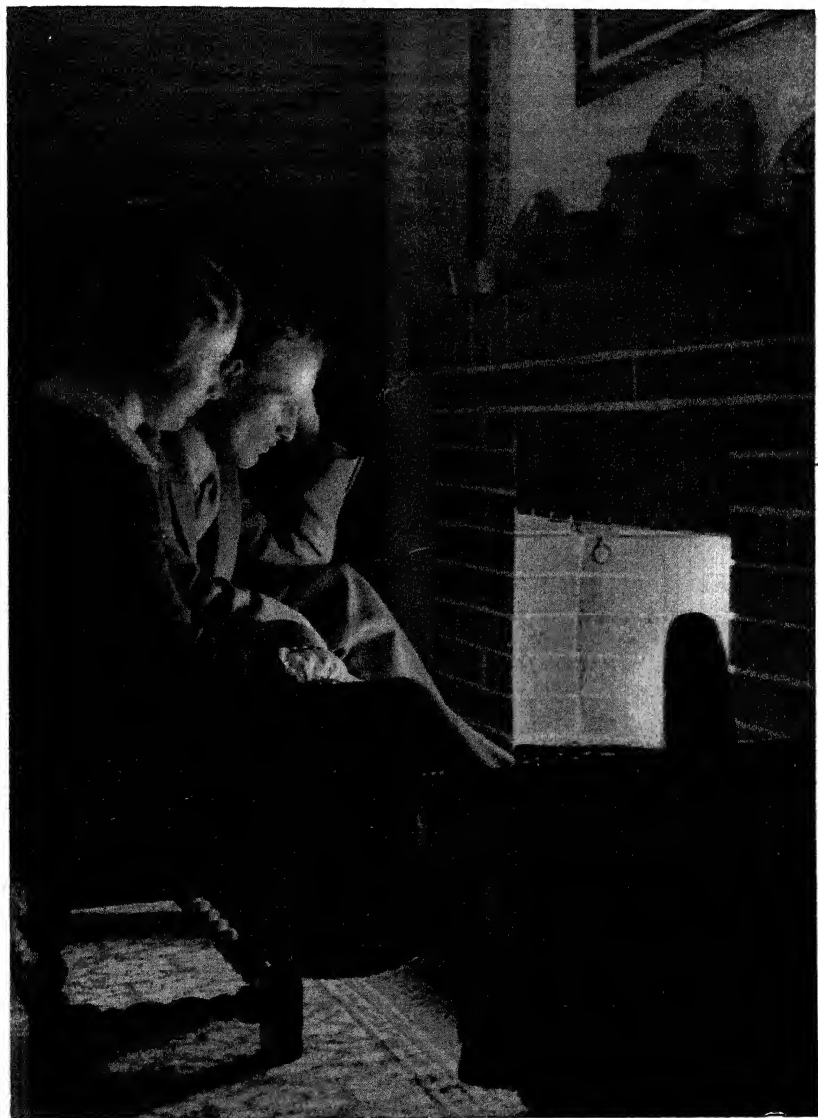
In the search for new ideas it sometimes happens that the leaping flames of a fire are used as a lightsource. The fantastic appearance of a huge bonfire is just as attractive as small camp fires or a wood fire on the hearth at home.

The mysterious and intriguing mood of the scene is a delight to the eye, but cannot be recorded photographically. This is partly due to the movement of the flames, which are never still, yet which cannot be shown in a single snapshot. A useful dodge is sometimes effective in this connection: two or three photographs may be taken of the fire on the same negative, and a much better impression of the moving flames is obtained—as well as greater printing density. (Those with miniature cameras must take three exposures one after another and then cut the film so that they can be simultaneously enlarged.) For superimposed negatives of this sort, the development should be arranged so that no one negative is so strong and dense than it blocks out the others. It is necessary, too, to remember that two or three negatives that are superimposed have twice or three times the density of a single negative.

The position is different when persons are to be photographed by firelight, for the brightness of the flames is insufficient for photography. Enough light for an exposure may be got by throwing a small piece of magnesium ribbon into the fire, or by using one of the magnesium flares that are on the market in the hearth instead of a fire.



ROUND THE FIRE. Roll-film reflex and panchromatic film.  $f/8$  — half a gram of flash powder thrown into the fireplace.



## THE GOOD OLD SILHOUETTE

The art of silhouette-cutting has little enough to do with photography, but there is no difficulty in photographing "shadowgraphs" which have the same appearance. There are various ways of doing this, but all have in common the idea of placing the person to be photographed in front of a brilliantly lit white surface so that they themselves are in deep shadow. A contrasty anti-halation emulsion is essential, and under-exposure and development to a high contrast in a strong developer (including extra bromide) are also very important.

The simplest method is probably the one in which the subject is placed in front of an open window through which only the sky can be seen, and photographed against the light of the setting sun. If shadow details appear on the negative, they must be removed by local reduction (see page 140), and the reduction must not extend beyond the profile of the subject on the negative.

Alternatively, the entire negative may be reduced until all the silver deposit has been removed from the shadows, and nothing but plain glass and gelatine remains. This will reduce the density of the lights considerably, of course, and to regain it the negative is treated after washing in the uranium intensifier. This will naturally affect only the silver image and leave the reduced shadows still bare.

Artificial light brings other possibilities with it. The model may be placed in front of a white background, while a strong lamp behind the former lights only the background and leaves the model in deep shadow. The exposure is then arranged to give clear glass shadows while the background is fully exposed.

With flashlight a different arrangement may be used: a white sheet is stretched over an open door-way between two rooms, with the model and camera in one room and the flashlamp in the other. The flash must be placed so that the model is between it and the camera. Since burning flashpowder often gives quite a large flame, the lamp must be placed so that the profile of the model will not be lit by any side light, which would spoil the effect. In particular, care must be taken that a true profile is presented to the camera, for even a slight deviation will alter the appearance of the model out of recognition.

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PROFILE. Panchromatic film, developed in concentrated metol-hydroquinone. A silhouette picture must have two tones only.



## GETTING SOFT FLASHLIGHT EFFECTS

Flashlight photography has had a bad reputation since the days when all flashlight negatives were hard, and anyone in the picture was made to look extremely ugly. The quality of flashpowder has been enormously improved in the last few years, and anyone who thinks that flashlight negatives must still be hard and unpleasant cannot be thinking of modern experience. Naturally, panchromatic materials are best with modern flashpowder since—even with compensated development—it is only this kind of emulsion which gives well covered shadows with plenty of detail.

It is not necessary to emphasise here the greatest value of flashlight—that it makes it possible to take photographs anywhere and at any time. The method described below, however, really involves a combination of artificial light and flashpowder which makes it possible to get effective lighting on rapidly moving objects with a minimum of current consumption.

The scene is first lighted by ordinary lamps to get the main effect desired. One lamp—which has been placed behind and to one side of the camera—is then removed and the flash fired from the point where it had been placed. A flash-pistol or a lamp with distant control may be used. The only other point of importance is that the shutter should not remain open longer than the flash is burning, but this may easily be got over by counting up to three, where “one” means open the shutter, “two” means fire the flash, and “three” means close the shutter again. After a little practice this process goes very quickly, and as soon as adequate experience has been obtained it will be possible to get “snapshot” pictures by flashlight in quite strong light.

A camera with synchronised flash and shutter release naturally makes matters easier still. For photographing at home, however, the flash should never be used in the reflector mounted on the camera, for this often gives unpleasantly flat lighting. Instead, the scene is first lit by a “home” lamp in the ordinary way, then the cable to this lamp attached to the camera connection and battery, and the lamp replaced with a flash-bulb. On operating the camera shutter, the flash will fire automatically as the shutter opens. It is essential to have a strong battery for the flash-bulb in this case (not less than six volts) because of the drop of voltage in the cable.

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THE PET BIRD. Twin-lens roll-film reflex, panchromatic film, two “hom” lamps and  $\frac{1}{2}$  gram flash-powder.



## DO YOU KNOW NIGGER-BOARDS?

Every photographer knows the uses of white or aluminium-faced reflectors, but comparatively few have heard of black reflectors or screens. Yet the use of a black screen is sometimes most valuable, and in certain types of work it is difficult to do without them.

A room, for example, may have a number of pictures on the walls: everyone knows how difficult it is to reproduce the pictures because of the reflections from their glasses. To avoid the reflections, it is necessary to determine from which direction the troublesome light reaches the glass, and this is easily found by considering the angle at which the glass is to the optical axis of the camera. As soon as the source of the trouble has been ascertained, a black screen between light source and glass will do away with the unwanted reflections.

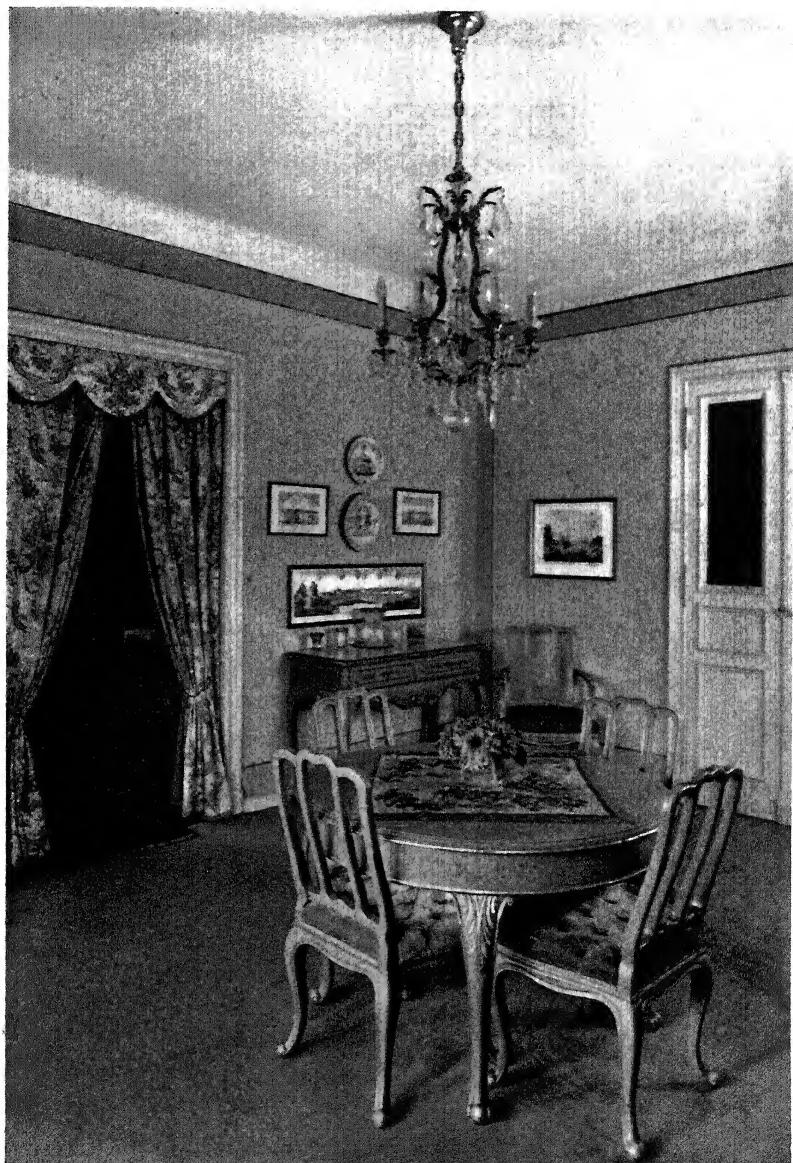
It often happens, too, that even when the lens hood is used the lens may be insufficiently protected from side or back-lighting, as in the case of artificial light. A black screen placed between light source and camera will prove a satisfactory solution to the difficulty.

In portrait work the black screen may be used in a similar way. It often happens that back-lighting is used, and a black screen beside the lamp will stop any stray light reaching the lens.

Black screens are conveniently made of thick cardboard or plywood on which black paper has been glued. They can be fixed with a couple of clamps to chair-backs or other articles of furniture that happen to be at hand. The black screen is specially handy in the fields of work indicated on pages 76 and 142, but equally useful on all occasions where reflections from metal, porcelain, or glass surfaces must be got rid of. (Polarisation screens [manufactured by Kodak and Zeiss] are the ideal solution to the problem of reflections. By placing them [like any other filter] on the lens, and slowly rotating them, the reflected light from the pictures, etc. in the room can be dulled down as required. The sole disadvantage involved is that the exposure must be increased to about four times normal.)

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INTERIOR. Stand camera and orthochromatic plate.  $f/18$  — 3 minutes exposure. Wide-angle lens. Black screens keep unwanted light from the pictures on the walls.





## SHADOWLESS BACKGROUNDS

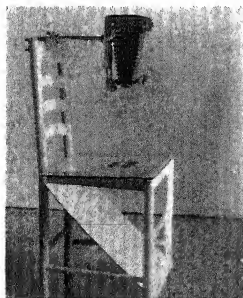
When small objects must be accurately photographed, the shadows they throw on the background are often very troublesome. There are a variety of ways in which shadowless lighting may be obtained.

Fig. 1 shows the simplest of all. A glass sheet is placed on a chair from which the seat has been removed, or on some other suitable support, and the object to be photographed placed on it. The camera is mounted over the glass, pointing vertically downward, and under the glass is placed a sheet of white or grey card at 45 degrees, which is reached by the light from any convenient window. This card is evenly lit, and the shadows thrown by the objects do not fall on it.

Fig. 2 shows a method using artificial light. The objects are placed on a cut-out circle of opaque paper on top of the glass sheet, and a lamp placed under the glass in such a position that the lens is shielded by the paper circle. Over everything is lowered a lamp reflector, which must have a larger diameter than that of the circular paper background, and the camera lens then takes the photograph through the opening in the back of the reflector. The light reaches the reflector through the annular space between it and the circular paper background, and since the objects are evenly lit from all sides, no shadows are thrown by them.

In the case of small objects with very shiny surfaces, it is sometimes necessary to photograph them under water. Fig. 3 shows the arrangement required, and it should be noted that the water must be quiet.

1



2



3



PARTS OF A CLOCK. Studio camera and orthochromatic plate.  $f/36$  — 2 minutes exposure.

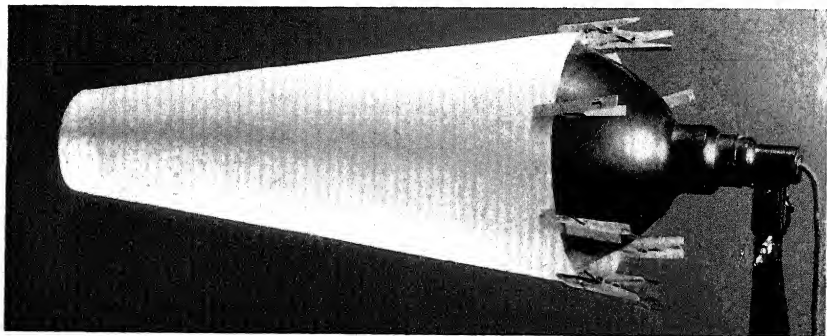


## EVERY LAMP A SPOTLIGHT

A spotlight is used when particularly hard lighting effects are wanted in the photograph: its characteristics are long heavy shadows, glittering high-lights, and intense local illumination. Unfortunately, a spotlight is somewhat expensive to buy, and it is not very suitable for average amateur work, since it usually needs a good deal of room and takes more current than can be drawn safely from the house circuit.

In many cases spotlight effects can be obtained in quite a simple way. A sheet of silver-surfaced paper, for example, may be rolled into the shape of a truncated cone, and placed over an ordinary "home" lamp in its reflector, so that the open end of the cone is some four inches across. The longer the cone and the smaller the opening at its end, the harder the lighting will be. If a number of lamps are available, the strongest should be used as the spotlight, and those who are handymen can increase the effect still further by introducing a plano-convex lens into the paper cone. The convex side of the lens should face outward.

Some types of enlargers with condensing lenses, or film projectors, can also be used as satisfactory spotlights, either with or without their front lenses. The light output of these instruments is very variable. When the projection or enlarging lens is removed, the output is usually many times that of the lamp alone, but when the above lenses are in position the light is very greatly reduced.



AT THE OPERA. Studio reflex camera.  $f/6.3$  — 1 second exposure, on panchromatic film. Note the hand shadows.



## GLASS FLASKS AS SPOTLIGHTS

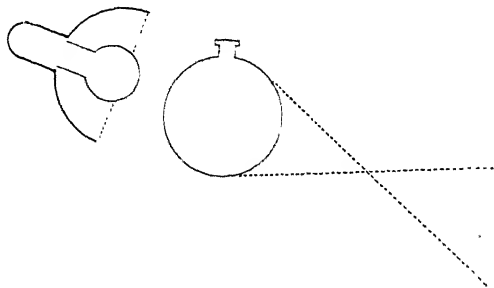
In earlier days, cobblers and other small craftsmen who worked in dark basements used to use spherical flasks full of water to light their work. The flask had the effect of a condensing lens, and concentrated the available light on one small spot where the work was done.

The action of the flask is very similar to that of a spotlight, and it can be used for photographic work with very useful results. It is, for example, an excellent source of light for photo-micrography (see page 54), while the hard lighting it gives is very useful indeed to throw up the textures of surfaces which must be photographed.

The intensity and size of the circular spot of light vary with the size of the lamp and the distance from the flask at which it is used. The nearer the flask to the object photographed, and the nearer the lamp to the flask, the more brilliant will the condensed light become.

Actually, since the flask is an optical instrument, it throws an image of the lamp on the subject to be photographed. This may be got rid of in two ways: either the point of strongest intensity is not used, or else an opal glass lamp is used as a light source. In the latter case, the image of the lamp will be merely a small bright circular disc.

If the flask is filled with a liquid that scatters light, such as very dilute milk, or a very weak solution of hypo with a few drops of hydrochloric acid added to it, a more diffused light beam appears, although the concentration of the light at a single point is still strongly in evidence. Further, by dissolving dyes in the water in the flask, a filtering effect may be produced, and it is sometimes useful in that the optical quality of the lens is quite unaffected by the filter.



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PERFUMES OF ARABIA. View camera and orthochromatic plate.  $f/36$  — 1 minute exposure. The spot of concentrated light can be seen clearly.



## METAL AND ITS PROBLEMS

When photographing metal objects, the most important necessity is plenty of patience, for no one will find that their first attempts give anything like a satisfactory and "true to nature" representation of the original. The difficulties involved are due to the polished surfaces of the metal, which reflect everything in the room around them.

It will be remembered that photographers often burn magnesium ribbon before photographing sculptures, in order to get a deposit of white magnesium oxide on them, while a silver bowl is commonly filled with ice-water, so that water vapour condenses on its brilliant surface. These methods admittedly get rid of reflections, but they destroy the characteristic appearance of the metal or sculpture which should be reproduced in the photograph. For this reason, it is also undesirable that a cone or cylinder of tracing paper should be placed over the objects photographed, for although this gets rid of reflections it destroys the cold hard surface so characteristic of metals.

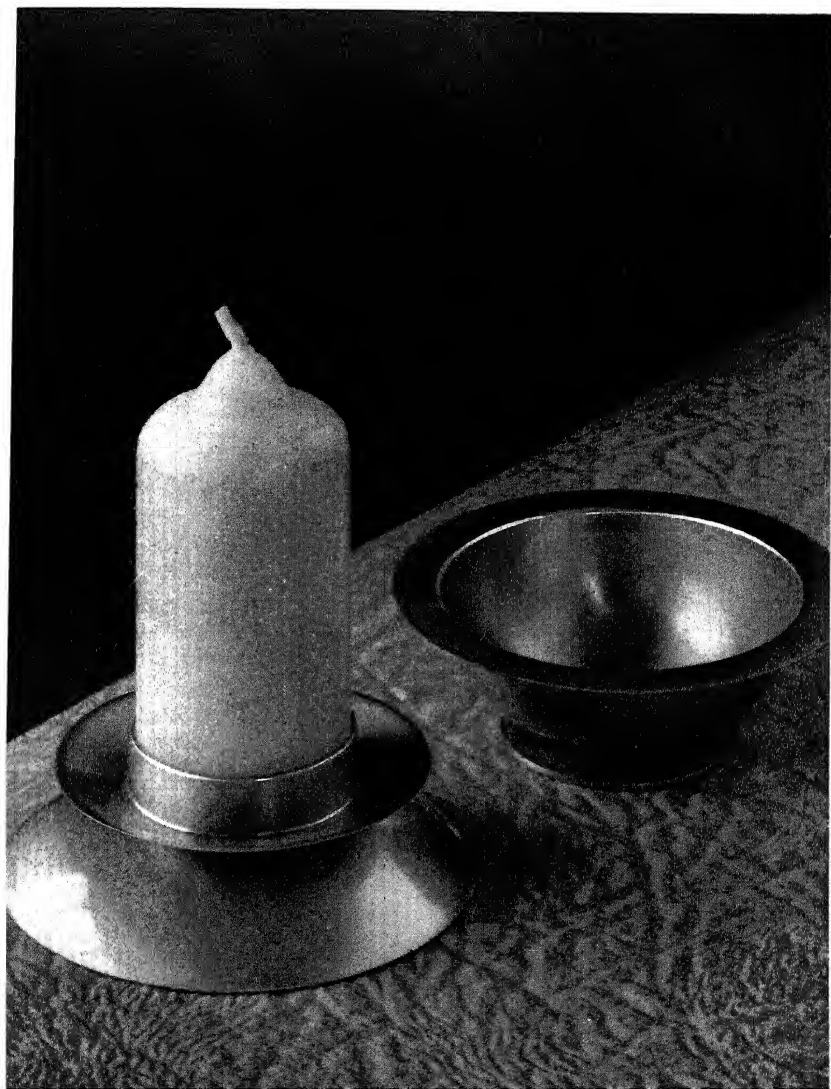
The right way to go about the work is to use black screens (see page 68), and to place large wooden frames covered with tracing paper between light source and object. The increased area from which the reflections come will then spread over the metal surface, and the diffuser will help to light the shadows at the same time.

Those who own an air-brush may spray black pigment on the tracing paper when illuminating the subject, in order to reduce reflections at unwanted points. It is thus possible to model the lighting by looking at the reflecting surface rather in the manner of a dentist and spraying the appropriate portion of the tracing paper black with the air-brush.

If no tracing paper frames are at hand, a wall or door that is painted white may be used, and after directing the lamps towards the wall the metal object may then be photographed in the reflected light from it. If some portion of the metal is still too bright, though the general effect is satisfactory, the strongest high-lights may be dabbed with putty, but this should only be done when one is quite satisfied that another style of lighting will not give the desired result.

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MODERN METAL WARE. Studio camera and orthochromatic plate in daylight, with two diffusers.  $f/36$  — 1 minute exposure.





## COINS

In a photograph of a coin, it is important that all the tiny letters and details be clearly seen. This may conveniently be arranged by holding the coin over a piece of burning magnesium ribbon, which will cover it with a fine white layer of oxide. After this treatment, no brilliant high-lights will remain to make the letters illegible.

Another method is to press the coin carefully into molten sealing-wax, in which all its details are accurately recorded. The mould can then be photographed (though all the ridges appear as depressions in the picture), or else a cast may be made from it in dental plaster of Paris, and the last painted grey after thoroughly drying.

The same effect can be got in another way, in which the coin itself is not photographed, but a matrix made from it. To this end a piece of coated paper (i. e. "art paper") is wetted and placed over the face of the coin to be photographed, the paper being forced into the relief of the coin by dabbing at it with a stiff brush. The paper will be found to "take" the finest details, and the process is concluded by covering both paper and coin with a thin piece of felt, and drying them under pressure in a printing frame. By lighting the paper matrix from one side, an excellent result is obtained, since the high-lights are not brilliant and all the details are readily visible. To make detail even more clear, the matrix may be cautiously dusted with graphite powder while it is still in contact with the coin.

The above two methods certainly reproduce all details of relief on the coin, but they do not show the characteristic metallic appearance at all. To introduce this without involving unpleasantly hard high-lights a simple dodge can be made use of. The coin is lit obliquely from the lower right-hand side (the normal light for a coin or medal is from the top left-hand side) and a transparency positive printed from the negative. This positive is then used as a negative to produce the final print. The image is a negative one, and since the shadows have turned into lights and vice versa, the lighting will seem to come from the top right-hand side. The high-lights are, of course, shadows, so no hardness can result.

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**TWO ASPECTS OF THE SAME COIN.** The upper illustration was taken with the lighting obliquely from the right. The lower one is a negative image of the upper one.



## BACKGROUNDS OF GOLD AND SILVER

In still life photographs, and in photographs of materials, the background is an exceedingly important matter. Its correct or incorrect appearance may make or mar the print. Nobody wants to use a background so full of fussy detail that it detracts from the main subject of the picture, for the general intention is that the background should be a background and not attract the eye. The difficulty is that the background often looks very empty and stiff if a single tone paper or card is used, so that white, black, or grey tinted cards are not always a satisfactory solution.

Very attractive results can be obtained by the use of silver or gold-surfaced paper in this connection. Though they, too, come out grey or white in the picture, their surface gives an unusual effect to the print. Paper and card with brass or gold powder dusted on their surfaces can be obtained from most window display shops, while other types of embossed and metallic surfaces can also be procured from the same source. Bronze powder may also be used to make up backgrounds at home: the paper or plywood is merely brushed with stiff starch paste and the powder dusted over it through a sieve.

The general characteristic of all these metallic surfaces is that they reflect light more or less strongly. Light objects placed on them throw both shadow and reflections, so that the surface on which the object is placed shows tonal values in both shadows and lights. Gold surfaces appear grey in the print, while silver surfaces come out practically white. Suitable lighting can also give brilliant high-lights on the papers, so that the background can be built up as a part of the organic composition of the picture.

It is a satisfactory technical point, too, that the object is differentiated from its shadow by reflections in the silver or gold papers. These last should not be confused with the papers which may be obtained coated with metal foil, or with metal foil itself. The latter possess a very shiny surface and act like mirrors, showing the outlines of objects in front of them very clearly. To use such a surface satisfactorily it is necessary to place matted celluloid or ground glass over them in order to break up the reflection and reduce their lightness in the print.

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JUST AFTER WATERING. Studio camera and orthochromatic plate.  $f/25$  — 35 seconds exposure to a single Nitraphot lamp.



## PORCELAIN AND POTTERY

When everyone knows that a particular material or substance has a shiny surface, it will probably not be recognised in a photograph where it is shown without its characteristic reflections. A porcelain figure without high-lights looks like a plaster cast, while a faience jug with very strong high-lights looks like real porcelain. As a material, porcelain always shows strong high-lights, but it also exhibits soft half-tones, and hard and heavy shadows seldom appear. The lighting must thus be soft and general, without throwing heavy shadows, and daylight coming from a number of large windows is the simplest way of getting the desired result.

The height from the ground at which the vessel is placed for photographing depends on its shape. The nearer the floor a cup is placed, the more pronounced are the high-lights inside it: the higher from the floor, the stronger the external high-lights. When the cup is almost back-lit, its outline becomes very much accentuated in the photograph.

On very smooth curved—and particularly on spherical—surfaces, we are accustomed to see the high-light in the form of an image of the window through which the light is falling, and the shape of the image shows up the curvature of the surface. Thus, if half-watt lamps are used to light porcelain, they must not be allowed to form high-lights, since this would give an unnatural appearance to the object. Moreover, as the near side of the vessel should show the window image, a frame stretched with light silk may be placed in front of a half-watt lamp, and a cross in black paper gummed on it to represent the shape and form of a window. If this frame is now held about 20 to 30 inches away from the lamp, it will be evenly lighted and the desired image of a window will appear on the object photographed.

A backed plate is essential for photographing porcelain, and it may be orthochromatic or panchromatic according to the colour of the subject of the photograph. For dealing with pure white porcelain, a process plate is very useful. These plates have a distinctly hard gradation and thus throw up very clearly all the fine contrast differences in the whites. It is, of course, necessary to keep development sufficiently short to avoid exaggerated contrast and lack of natural effect in the print.

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TEA SET IN PORCELAIN. Studio camera and orthochromatic plate in diffused daylight.  
f/50 — 1 minute exposure.



## GLASS

Glass, jewels, or celluloid: all are characterised by their surface reflections and their transparency. For a true and naturalistic reproduction, the transparency is of primary importance, which consequently means that a photographer must distinguish between empty and full glassware.

Empty bottles, glasses, and the like are best taken in diffused light against a light grey background. Back-light or strong side lighting is not recommended, as the shadow details may be lost. The shadows should be rather darker than the background, while the reflected high-lights should naturally appear full white in the print. The flatter the negative is, the thinner, more brittle, and appropriately glassy will the objects appear.

Many glasses have the annoying quality that they do not stand out uniformly against the background, and parts of them tend to be invisible. In this case, books or boxes may be placed at the side of the subject so that a shadow falls on the background and darkens the particular point where differentiation is wanted. The value of a single hanging lamp over the subject must not be under-estimated. Top-light often has the advantage of not throwing any noticeable shadows, yet of shining through the transparent body and causing it to light up. A diffusing screen must be used, however, in order to avoid the wires of the filament being reflected in the glass surfaces.

When glasses are very thick, or are filled with liquids, matters are different. A glass of liquid shows optical phenomena, for the light is refracted in its course through the glass in the same way as with a prism or condensing lens. Glasses of this sort should thus be taken with a high back-light, so placed that the light falls obliquely on the far side of the glass from the camera. To throw up the optical phenomena more strongly, a dark background may be used. A single light, too, is not enough, since it gives no possibility of varied treatment, and a number of reflectors may profitably be used to give good modelling and light the thicker parts of the glass itself. By moving the reflectors about during exposure, extremely satisfying results are often obtained.

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WINE GLASSES. Studio reflex and orthochromatic plate in daylight. *f*/36 — 2 minutes exposure. Note the faint soft shadows from the diffused light.





## CUT GLASS

The method used in photographing glasses filled with liquid is also used where cut glass is in question. While, however, the problem in one case is to differentiate between the two substances, and make the glass appear different from the fluid, in the other a single homogeneous substance is present, so it is no longer necessary to emphasise the high-lights with reflectors. But it is still essential to use back-lighting in order that the glass may appear transparent.

Transparency is perhaps best shown by dividing the exposure into sections, the lamp being moved into another position for each, so that when the exposure is complete it has moved in a full circle round the object photographed. Even when this is done it is preferable to use a second weaker lamp to give a definite lighting from one side. This second lamp should essentially remain stationary during exposure. Modelling can only arise when one side of a subject is in shadow and the other shows high-lights, and such lighting is only possible with a lamp in a fixed position.

It is often recommended that cut glass vessels should be filled with a coloured liquid in order that the far side does not affect the side nearer the camera. This unfortunately has the result of giving a false impression, for the glass no longer seems to be hollow. This difficulty is better got over by using a long-focus lens, which—if not stopped down too far—will show the front and sides of the glass sharp yet throw the back out of focus. It is also possible to avoid lighting the back of the glass too brightly. A frame may be placed between lamp and glass and small card shades attached to the frame by drawing pins so that the light only reaches those points that are intended to be lit. The farther the background is from the glass, the less the chance of unpleasant shadows appearing on it. Top light can often be made use of in this case. A spot-lamp is best used, with a card mask in front of it adjusted to allow light to reach the front of the glass vessel, but not the back.

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CUT-GLASS VASE. (Top left) Ortho film and (Top right) Panchromatic film: glass filled with permanganate solution. (Bottom right) Panchromatic film: glass empty.

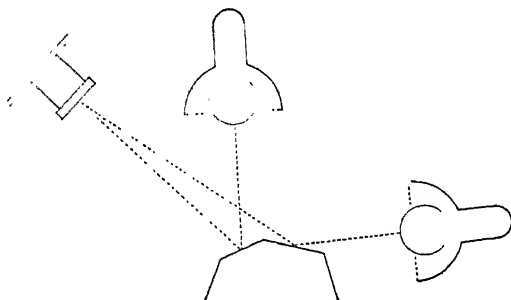


## NATURAL CRYSTALS

The photography of crystals is a troublesome business, which needs endless patience and a good deal of technical ability. When anyone examines a crystal, he holds it in his hand and slowly turns it round, so that the light catches its faces. This turning can be shown in a cinema film, where a more or less satisfactory perspective can be produced, but the still photographic picture must show several faces of the crystal simultaneously to give a satisfactory result, and this is by no means easy.

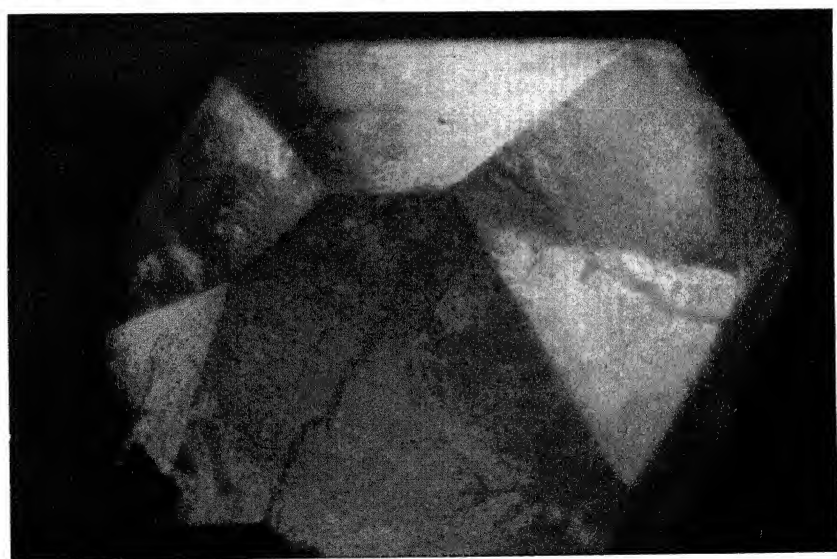
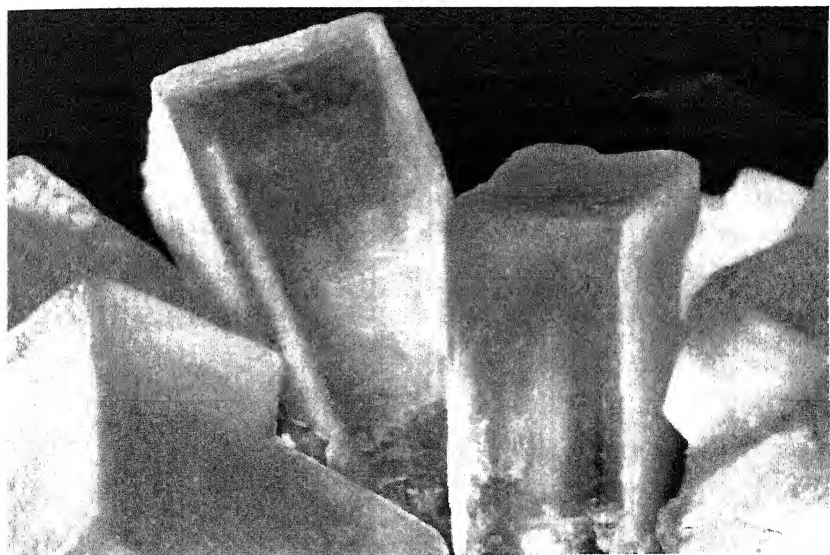
The surfaces of a crystal are only really visible when light is reflected from them at the appropriate angle, and reaches the camera lens, so that for a really satisfactory result each face of the crystal must have its own light source. The illustration below shows diagrammatically two faces of a crystal lit by lamps in such a way that the light is reflected into the lens from the faces. It is not strictly necessary, of course, to use as many lamps as crystal faces, for a series of reflectors is usually just as satisfactory in practice. Care must also be taken that one light source is nearer than the others, so that the faces are not all equally light.

It will often be found possible to get good results by moving the lamp during the exposure. In this case, however, the lighting of the surfaces is left to chance, and the result may be unsatisfactory. The most satisfactory type of lamp is one giving soft rather than hard light, and placed at a considerable distance from the subject of the photograph.



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POTASSIUM BROMIDE CRYSTALS (Top) and QUARTZ CRYSTALS (Bottom). View camera and orthochromatic plate at  $f/16$ .



## ICE-SPANGLES

The two essential technical points in photographing satisfactorily the ice spangles on a window-pane, or any other kind of crystal growth on a sheet of glass, are a dark background and back-light. With these two conditions fulfilled the tiny details shine out in brilliant contrast against the dark ground, and their shapes and forms are clearly shown. The best results are got by photographing a window-pane at night at such an angle that the light from a street-lamp falls on the pane in the correct way. Long exposures are necessary, but this is not important unless a thaw sets in.

The light itself must not be in the camera field, or the crystal structure will not be shown properly, and for safety it is advisable to use a lens hood and to cut out all stray light from areas not included in the camera field. A contrasty emulsion, as—for example—is used on lantern plates, is necessary, and it should be properly protected from halation effects.

Ice spangles can be made artificially by coating a glass plate with a hot solution of gelatine and then cooling the plate strongly. After a short time the crystals will appear, and they remain permanently. In a similar way, solutions of various chemicals may be allowed to crystallise on glass plates with extremely varied and attractive results. Suitable substances are potassium chromate, barium nitrate, sodium nitrate, potassium chlorate, benzoic acid, sodium phosphite, copper acetate, alum, ferrous sulphate, uric acid, zinc acetate, citric acid, uranium nitrate, sodium oxalate, zinc sulphate, pyro, lead acetate, etc. The size of the crystals is adjusted by making the solution more dilute or more concentrated, and smaller or larger crystal formations are the result.

To get the best results, the glass plate must remain level and undisturbed while the solution is crystallising out. When dry, the plate is placed in front of a black background and lit by a lamp obliquely from behind, care being taken that the lamp itself does not appear in the camera field.

Particularly beautiful pictures are obtained by photographing crystal formations in polarised light. (Polarisation filters are now available for cameras.) The polariser must be turned until their correct position is found, and it will be seen that during the turning the image changes its appearance continually.

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JACK FROST. Folding plate camera with contrast plate.  $f/9$  — 10 minutes exposure. Negative developed in concentrated hydroquinone.



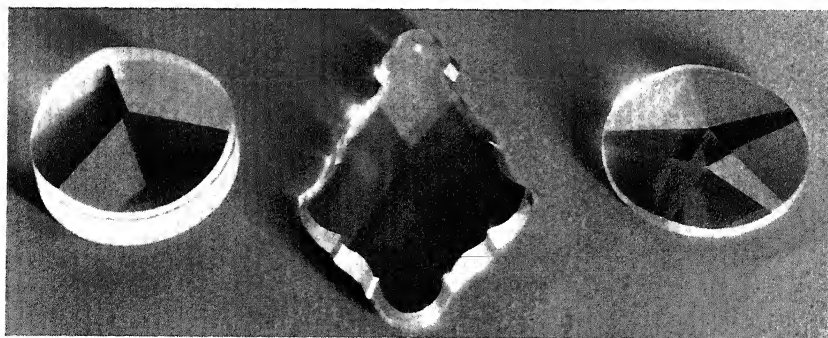
## MULTIPLYING THE LENS WITH PRISMS

If a piece of prismatically cut glass is held in front of the camera lens, several images of the subject appear on the ground glass instead of one, and when the glass is revolved in front of the camera, the images rotate with it, their outlines merging into one another. To photograph this effect, it is only necessary to turn the glass into a suitable position where the images are pleasingly arranged, and to release the shutter in the ordinary way.

This is easiest if the glass is attached to the lens hood with surgical plaster or insulating tape, and the lens hood itself rotated as may be found desirable. The arrangement of the images is less simple, and in order to avoid confusing the picture it is preferable to use a dark background so that the images will merge into darkness instead of into one another. In the case of a portrait both background and clothes should be dark.

The distance of the images from each other always remains the same, and even if the camera is taken farther from or nearer to the subject this is true, for the scale of reproduction alone is altered by the move. A lens of different focal length, however, will alter the separation distance of the images.

If a strip of glass that is flat on one side and convex on the other is placed in front of the lens, the image on the negative will be distorted in the direction of the length of the glass. By this means it is possible to show people either very long and thin or very short and fat, just as we see ourselves in the distorting mirrors on fair-grounds.



POKER PLAYER'S NIGHTMARE. Taken through a tri-prismatic glass.  
THE MAGIC WAND. Taken through a penta-prismatic glass.





## WHAT GLASS SHEETS WILL DO

Glass plates of different sizes are extremely useful in the production of unusual photographs. This is particularly true with still life, small details of clothes and costumes, or where the texture of materials must be shown up fully. In the last case, glass plates give an almost unique effect when used correctly.

The question of the glass thickness is the first to be considered. All objects resting on glass are reflected in the two surfaces, so that a double reflection appears. The thicker the glass, the wider these reflections are separated. This fact may be utilised in photographing jewellery, where the double reflections of the high-lights in the glass produce a very effective picture.

Apart from the thickness of the glass, its distance from the background is important. The greater this distance, the larger the shadow thrown on it by the object photographed, and with oblique lighting the shadow may move completely away from the latter. This is a useful aid to composition, since it makes it possible to place the shadow in such a position as will divide the background pleasingly into light and shadow. By tilting or curving the background, the shadow shape can be altered.

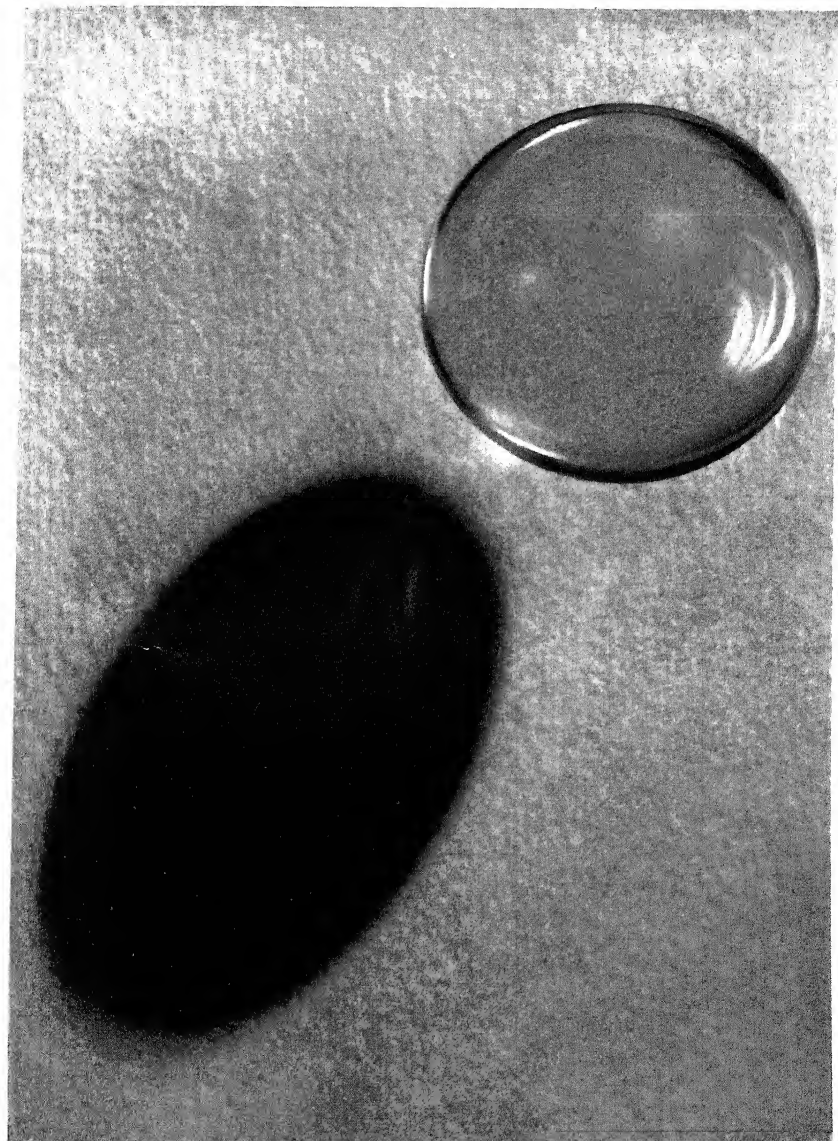
Several glass plates may be used instead of one. Various trick effects are possible by this means, such as a line of text (cut from paper and placed on one sheet of glass) which floats over the main picture. The various objects may also overlap one another.

A good deal of care is always required when working with sheets of glass, particularly with the lighting. Strong back-light should be avoided, for the glass itself will reflect some light into the lens and an image of the light source will appear in it. The camera and other objects around it should further not be strongly lit, as they may start to show reflections in the glass that appear in the picture.

Absolute cleanliness of the glass is essential, and fingermarks, dust, and the like must be removed by polishing with french chalk suspended in methylated spirits. Metal polishes are also useful.

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GLASS BALL. Studio reflex and orthochromatic film.  $f/18$  — 8 seconds exposure with arc-lamp. The glass ball was placed on a glass sheet, with a sheet of paper below it.



## THROUGH THE LOOKING-GLASS

To photograph a series of mirror images of an object instead of a single one it is necessary to find two sufficiently large unframed mirrors of equal size. The two are used as a background to the picture, and are placed at a particular angle to one another. The smaller the angle, the greater the number of images: at  $60^{\circ}$  five images appear; at  $45^{\circ}$  they increase to seven. As the number increases, the images grow less brilliant, so that too small an angle should not be used in practice. It is best to use  $72^{\circ}$  which gives four mirror images plus the original, or five images in all.

The object or person to be taken is placed between the mirrors facing away from the camera, and to stop the camera itself appearing in the picture a large sheet of black paper must be hung in front of it with a small hole through which the lens projects.

Other effects may be obtained if three mirrors are used in place of the two mentioned above, the three being arranged to form the sides of a prism. Any object within the three surfaces will show a number of reflected images. The lighting should be arranged to be even on both sides. This gives an evenly bright series of reflected images.

It is particularly important that the mirror should be unframed, since multiple reflections of the frames would otherwise appear in the picture. It is also necessary to use a small lens aperture to get the great focal depth required. The images are not situated on the surface of the mirror, but at the same distance behind it as the object photographed is in front.

The repetition of a single figure as an infinite series of images is not difficult either. Two mirrors of equal size are placed so that their reflecting surfaces are parallel, and the centre of one of them is scraped away in order to allow the lens to photograph through a small hole. If the camera is set up to expose through this hole, and the object to be duplicated is placed between the two mirrors, an infinite series of reflections will be formed. The scraped hole in the mirror naturally also appears in the picture, and unless the photographer is prepared to retouch all its images on the negative, it is best to arrange the subject so that it is covered up.

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RING-O'-ROSES. View camera and panchromatic film.  $f/32$  — 1 minute exposure with two half-watt lamps. The frog is placed so that the images seem to be holding hands.



## PHOTOGRAPHIC ORNAMENTS

The important part about an ornament is usually its symmetrical appearance, for it must repeat a particular design at definite intervals. It is consequently necessary to use some means for producing this repetition when a pattern has been made up, and it happens that the camera can do this very simply. It is not important whether a photograph or a drawing is actually used as an original pattern, and the main outline of the process is as follows:

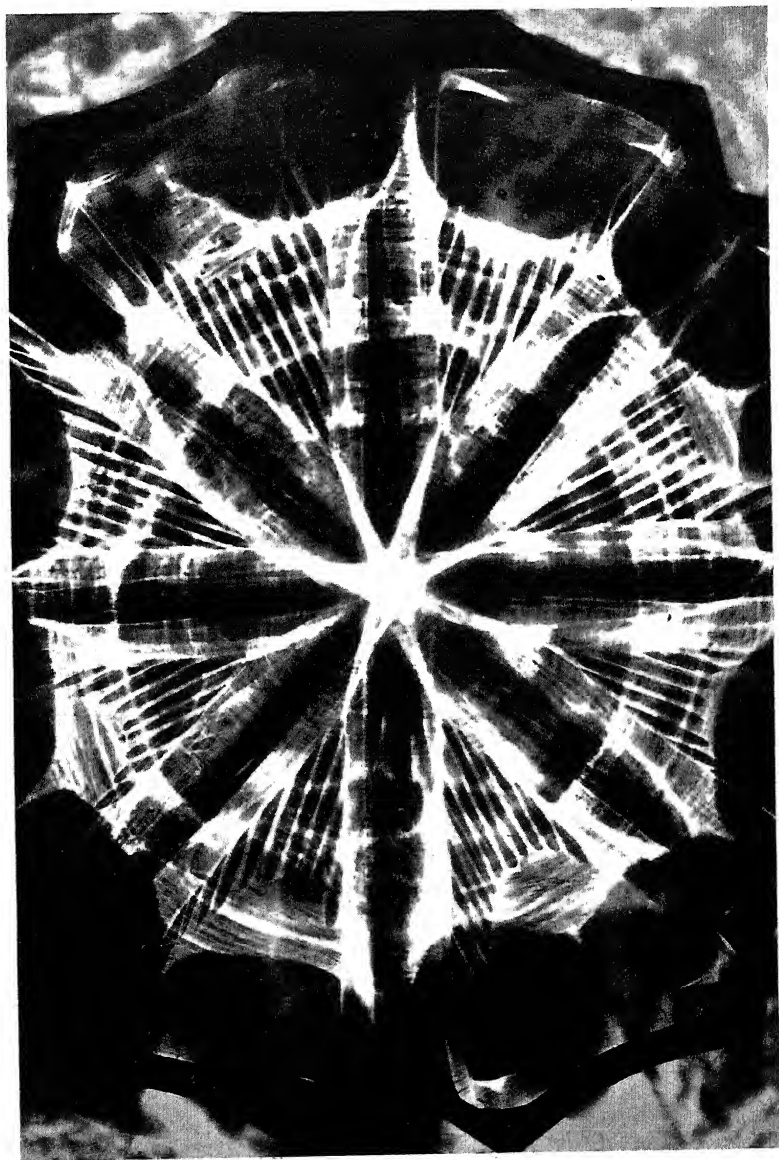
The original pattern is placed on a table, and a mirror without a frame placed on it in a vertical position. If one looks down at the mirror from an angle of about  $45^{\circ}$ , a second image of the pattern will be seen lying beside the original. If a larger number of images are required, two mirrors may be used instead of one. By placing them upright on their edges at an angle, 3, 6, 12, or even more images will appear according to the angle. The technique of the work is thus rather similar to that involved when the kaleidoscope is used. (See page 100.)

Old washed-off plates can be used for mirrors, if they have been well blacked on one side (easily done by lighting a wad of cotton wool in a dish containing a little turpentine and holding the plates in the smoke). The "silver surface" mirrors now available are more satisfactory if the various images are to be evenly brilliant. It is obvious that the original will be much brighter than any of its reflections, because of the loss of light in the mirrors. This difference in brightness is very strongly marked where black glass mirrors are used, and it is usually necessary to adjust the densities of the various parts of the image by painting some of them over with neococcin solution.

Those who do not object to expending time and trouble can of course cut out portions of prints and stick them down on paper in a symmetrical pattern. Some of the prints will be normal, while others must be reversed left to right. It is much less tedious, however, to use the optical method just described; quite apart from the fact that the cut edges seldom fit each other accurately and usually appear ragged.

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SYMMETRICAL ORNAMENT. Made from a shadowgraph (see page 6) with two silver-surfaced mirrors and a contrasty plate in the camera.

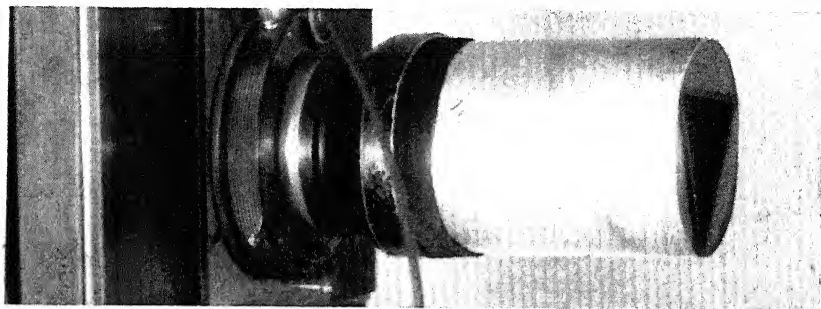


## USING A KALEIDOSCOPE

The kaleidoscope, so popular among children because of the never-ending variety of its patterns, can be used in conjunction with the camera to produce all kinds of strange pictures. The designs it produces normally can of course be photographed, or else the bits of shell and coloured glass may be removed and other objects substituted for them. The objects photographed need not necessarily be within the triangle formed by the mirrors at all.

A portrait taken through a kaleidoscope shows several images instead of one, the images being superimposed on each other. For work of this kind, the kaleidoscope is fixed to the lens by pushing its tube into the lens hood and holding it firmly in place with rubber bands or packing. A longer exposure time than normal will be necessary, for three pictures are being taken instead of one, and the lens aperture is somewhat reduced by the presence of the tube in front of it. As the tube is turned, the images will naturally circle round.

The same principle may be adapted to the enlarger instead of the camera, and three or more images of the complete negative will result. To avoid the repeated appearance of the right angled corner of the picture, the image may be painted over at the important outlines, the paint reaching right to the edge of the picture. The superimposition of the images is often troublesome, since the white dress in one image may coincide with the face tones of a second. A dark background and dark clothing are thus most suitable for kaleidoscopic portraits.



HEAVY SEAS. Studio reflex.  $f/8$  — 2 seconds with kaleidoscope in front of the lens. (The feet actually appear as three other images on the negative).

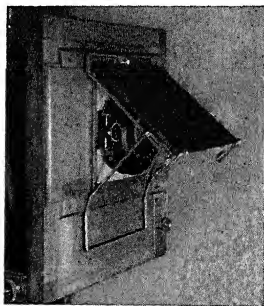
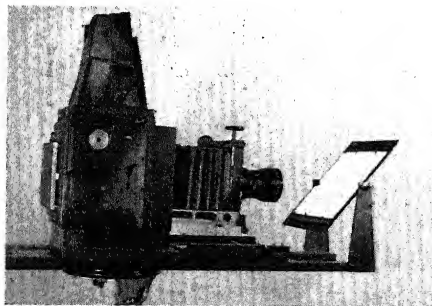




## LOOKING ROUND THE CORNER

Anyone who has looked inside a reflex camera knows that the mirror is set at  $45^{\circ}$  to the light reaching it, and turns the image through an angle of  $90^{\circ}$  on to the ground-glass. A reflex can thus be used to photograph round a corner if so desired. For some purposes, however, a mirror placed at an angle of  $45^{\circ}$  in front of the camera is no less useful. Fig. 1 shows the way in which the mirror may be supported while fig. 2 shows a specialised mirror-holder which is on the market. (With this last device distorted images can also be produced by setting the mirror not at  $45^{\circ}$  but at a larger or smaller angle.)

The advantage of such a mirror is obvious. A page from a book, for example, must be photographed. The book is laid on a table, and the camera placed over it, the mirror at  $45^{\circ}$  reflecting an image of the book into the lens. The camera need not then be moved from its horizontal position. A similar problem is involved in photographing painted or mosaic ceilings, and here the mirror is turned through  $180^{\circ}$  until the ceiling is reflected into the lens of the camera. A third advantage occurs in architectural work, where the space is short, when the mirror may with advantage be placed against the wall and the camera pointed into it at the appropriate angle. The resulting picture appears to have been taken from the inside of the wall, and a wider field is included in the negative. Photographs taken through the mirror are naturally reversed left to right, and this must always be remembered. By turning the negative over in the carrier of the enlarger, a correctly oriented print is obtained.



THROUGH THE BOTTOM OF A WASH-BASIN. Folding camera, and artificial light.  $f/6.3$  — 3 seconds exposure. The camera pointed into a mirror under a glass bowl.

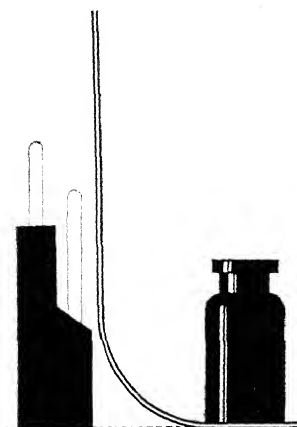


## MISTY BACKGROUNDS

Illustrations often appear in magazines in which certain persons or objects are much more strongly printed than the rest of the picture. A careful examination will show that the entire background is printed lighter in tone, and may even at times be misty in character. This dodge accentuates the important parts of the picture at the expense of the background.

The usual method of getting this result is that of spraying the background with white paint from an air-brush, though a similar effect results when the negative is suitably painted with neococcin over the background areas. On some occasions, however, it is easier to arrange matters at the time the photograph is taken.

In still life, for example, matt celluloid sheets may be slid between the various portions of the subject so that the important parts are in front while the unimportant ones are blurred by the celluloid. The result is rather different from that described above, since the farther the objects are from the celluloid, the less clear are their outlines.



For dealing with large areas wooden frames covered with light gauze may be used. These again give a different result, since the structure of the gauze usually appears in the print. In all work of this kind it is important that the light is diffused, and does not throw any very strong shadows: not only does hard lighting not suit the style of the picture, but when objects are behind gauze the effect of a strong side light on them cannot be shown. Frames may also be made with tracing paper that is impregnated with paraffin or castor oil. These have a somewhat weaker effect than the gauze frames described above.

LABORATORY BENCH. Folding camera and panchromatic film.  $f/12$  — 6 seconds exposure to daylight and two Mazda lamps.



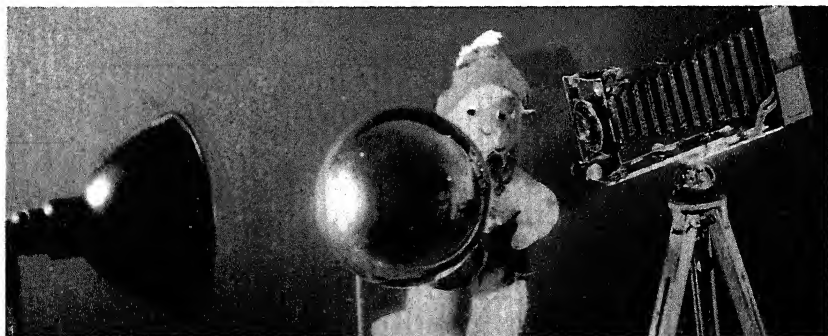
## OPTICAL CARICATURES

In the camera, the perspective of the world before us is reduced to a single flat plane. Should this plane become curved and not flat, the picture would show distortion and false perspective.

This fact can be put to good use when it is desirable to show Nature As She Is Not. The function of such distortion is not always one of humorous intent: deliberate distortion can be applied to a portrait to make the person in it appear thinner or stouter.

Distortion of all kinds can be produced in the enlarger by bending the bromide paper in a longitudinal or transverse direction.

Very severe distortion is more easily produced in the camera, by photographing the reflection of the subject in a highly-polished spherical or curved surface such as the back of a silver spoon, the head-lamp of a car, or one of the ornaments used to decorate Christmas trees. The arrangement is illustrated below, and since the camera must not appear reflected in the polished surface the picture must always be taken from the side. It is advisable in work of this kind to place the lamp lighting the subject so that a narrow beam of light reaches the latter. If all the rest of the room, and the objects in it, are also lit, the entire room will appear in a more or less distorted form in the picture, and will distract the eye from the main subject. A dark cloth stretched behind the subject itself is often very handy.



OUT FOR THE NIGHT. Folding camera and panchromatic plate.  $f/18$  — 10 seconds exposure with single lamp in reflector.



## WHEN THE EMULSION MELTS

If negatives (whether plates or films) are left to dry in the hot sun, or are put near steam pipes for the same purpose, the swollen gelatine of the emulsion often melts and runs from the glass or celluloid in drops. This property of gelatine can be used to produce very effectively distorted images, but it is essential to give a little "composition" rather than to allow the gelatine to flow naturally.

A thoroughly washed negative is left in the drying rack for a short time until the drops of water on the emulsion have evaporated. This is important, for each drop will cause trouble in the melting. The back of the negative must also be clear of water-drops. Then the negative is held over a small and only moderately warm flame, such as that of a spirit lamp. As soon as the gelatine begins to melt, which can easily be determined as the emulsion suddenly assumes a glassy appearance, the negative is tipped and twisted about in an attempt to divert the flow in the desired direction. As soon as the correct effect has been produced, the negative is laid in a horizontal position and allowed to cool.

The emulsion should be allowed to run just a little less than it is actually wanted to, for it always moves a little farther as it cools down. The heating must thus be stopped, and the negative brought to the horizontal position, rather before it seems to be necessary. As soon as the gelatine has "set" again, the plate can be put in a rack to dry.

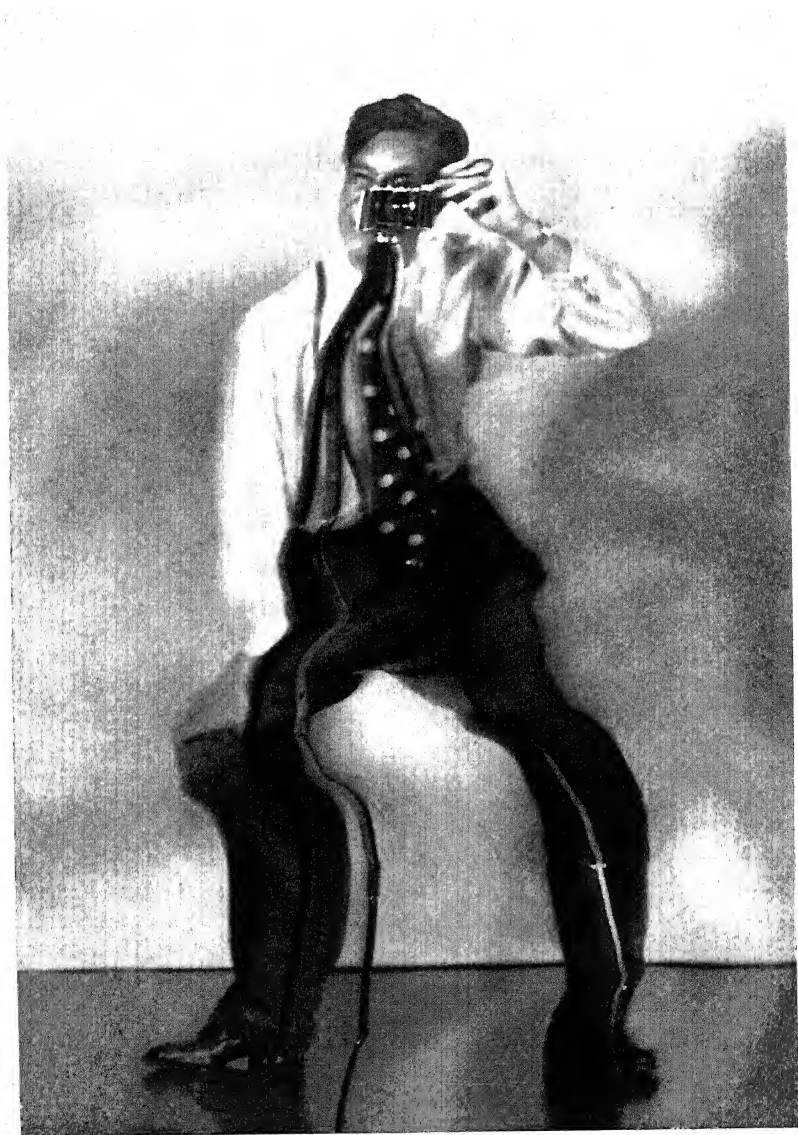
Where it proves impossible to melt the emulsion, whether this is due to age or the use of a hardening bath, it is useful to give the negative a soaking in dilute ammonia, which has the effect of softening the emulsion and making it easier to melt. In very dubious cases, bathing in caustic potash solution and washing for fifteen minutes before starting the melting process is usually effective.

With films, an open flame is risky on account of their inflammability, so an electric heater should be used. A hair drier which blows a stream of hot air is also very satisfactory.

Negatives intended to be melted in this way should not be developed in pyrocatechin, or fixed in a hardening-fixing bath, since both these treatments make it difficult to melt the gelatine.

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"SET THE CAMERA ON A FIRM TRIPOD . . ." The negative was warmed in strips and the gelatine allowed to flow in two directions across it.





## CATCHING THE GHOST

There are quite a number of people who still take all "spirit" photographs at face value, in the touching faith that the camera cannot lie. Most photographers, however, know that the camera can do a good deal of lying under the mantle of "true to life" prints, and the photography of spirit manifestations is not seldom a case in point.

There are various methods of going about the work. A suitably clothed person may be used as a ghost, and taken against a black background, out of focus, with a piece of gauze stretched over the lens. The plate is then retained until a suitable medium is found, when a portrait taken under normal conditions is made on the previously plate. The negative can then be developed under the strictest supervision by the medium in full confidence as to the result.

If the medium is initiated to the rank of a confidant, matters are much easier. The medium is taken simultaneously with the "ghost," the latter perhaps having one hand on the head of the medium. Half the normal exposure is first given, and then the shutter is closed and the "ghost" told to get out of the camera field. (The medium must naturally not move.) When the medium alone remains, the rest of the exposure is given, and when an ordinary room or landscape has been used as a background, the ghost will be semi-transparent in the print.

For less clear manifestations, a white cloth tied to a long stick is useful. This is waved about in the camera field during a time exposure. Supposing, for example, that the cloth is shaped to represent a human form, it will appear more or less as such in the print, except that the movement will blur its outlines, and an apparently genuine manifestation will appear in the negative. To get a sufficiently soft outline, the lens is stopped down and a long exposure given.

Ghosts can also be conveniently produced by using a semi-silvered mirror at an angle of 45° in front of the camera lens. Here the ghost must stand on one side of the camera and the mirror be adjusted until its reflected image is correctly placed. A completely black background behind the ghost itself is essential.

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THE APPARITION. The two exposures were made one after another on the same negative. (1) Ghost: half a second exposure. (2) Child:  $f/6.3$  — 1 second exposure.



## PHOTOMONTAGE IN THE CAMERA

Photomontage is quite easily done on the negative by taking a number of photographs against black backgrounds on the same plate or film. In order to be independent of the black background, a series of black paper masks may be used instead. These make it possible to get practically any form of photomontage.

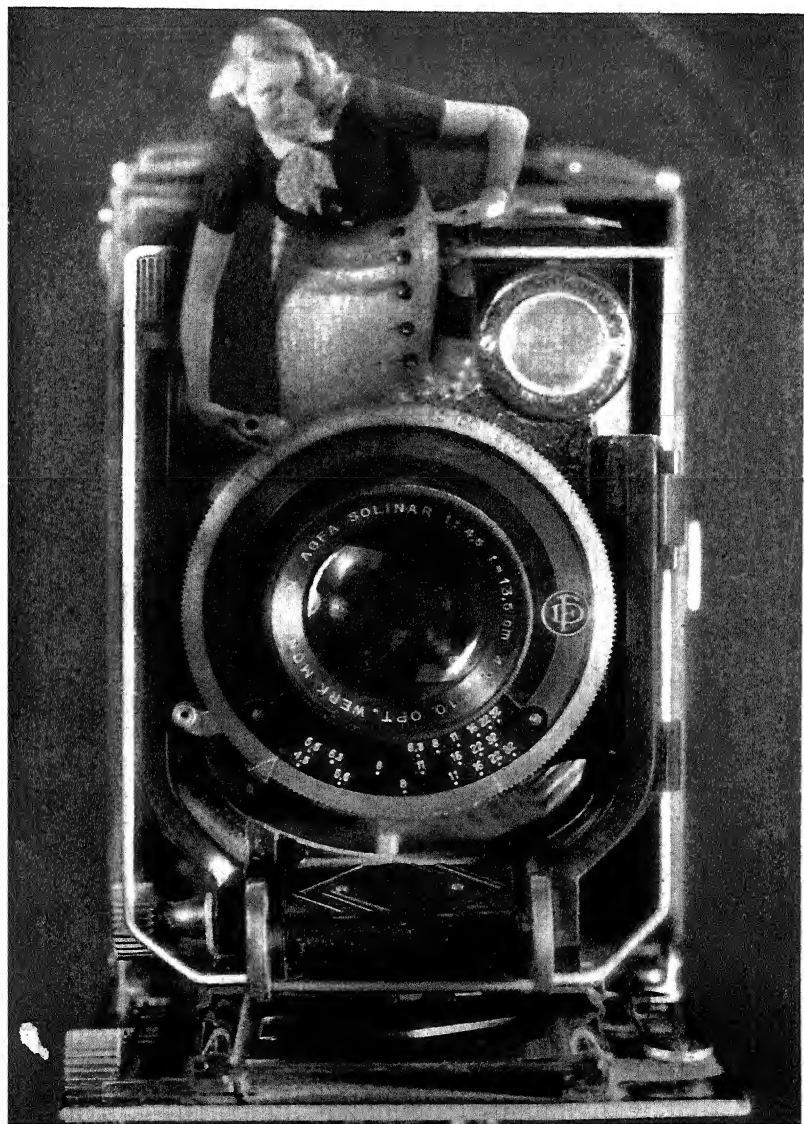
A good effects box is necessary in front of the camera lens (see illustration of reflex on page 112) and the masks are attached to the front opening. A box of this kind can be made at home, but it must be really light-tight, since even black paper reflects some light into the lens, and would form a shadowy grey image if light struck it. Glossy black paper should not be used, nor should a card with a slightly shiny appearance. The best material of all is black "velour" paper, which is very deep matt, though a card covered with black velvet cloth is naturally also satisfactory.

The exposures are made one after another with the correct masks in place. In doing this, the position of the objects in each exposure must be carefully arranged, and it is useful to sketch the position of the first object on the ground-glass with a greasy chalk so that the next exposure can be correctly fitted to it. A piece of tracing paper held against the ground-glass can also be pencilled to show correct register, while thin wires and black thread may be used to show the important points of the subjects which must be correctly placed in both exposures.

This technique is particularly suitable in all cases where the images of the two exposures must melt into one another, but it is just as satisfactory for cases where a sharp separating line is wanted. In the latter case, the masks must be extremely accurately cut. In combination with double-printing and the usual "cut-out and paste" type of photomontage, an unending number of effects can be produced, provided that a formal plan of campaign is drawn up at the beginning of the work. Such a plan is essential, otherwise it will probably be found after a good deal of the work has been done that something has gone wrong, and everything must be started again from the beginning.

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"SELF-PORTRAIT DEVICE." The two exposures were made through a mask and its complementary mask, on the same negative. Studio reflex with effects box, f/9 under studio lighting.



## PHOTOMONTAGE BY THE "WET" METHOD

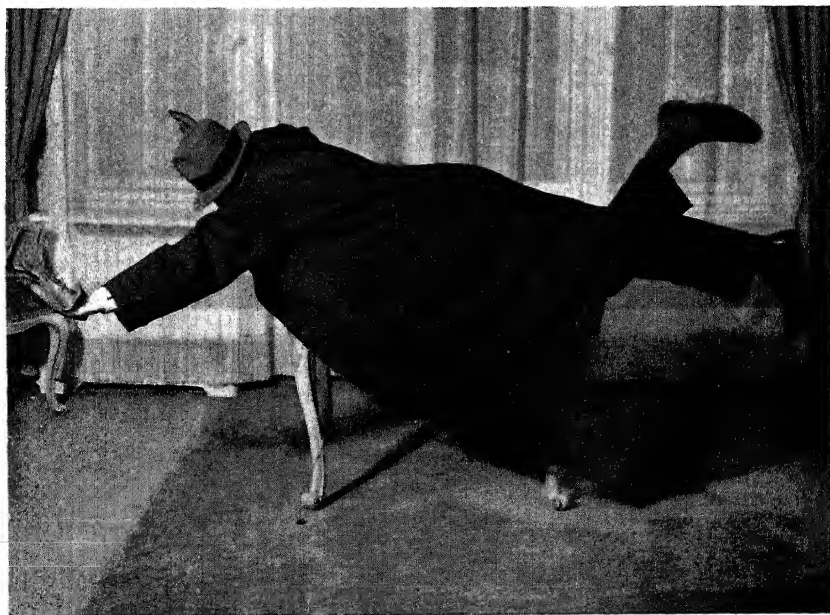
A few possibilities should now be mentioned which may prove useful when one has run up a cul-de-sac and sees no way out. A developed but unfixed bromide print, for example, may be brushed over with a solution containing 130 grains of potassium ferricyanide and 45 grains of potassium bromide in 2 fluid ounces of water, which will bleach the unwanted parts of the image back to a sensitive silver emulsion. Although the speed of printing is far slower than before, it is quite a simple matter to print from a second negative on the bleached parts of the print. In order to find out how much less sensitive the paper is, two prints should be made and the first one used as a trial.

Again, if persons must be shown in strange positions, masks alone are not enough, and the following method is preferable. After taking each partial exposure, the negative is developed to as good a density as possible, and then washed and dried quickly without fixing. When all the exposures have been made and developed, the plate is fixed and washed as usual. The negative will then be very hard, and may either be reduced with ammonium persulphate or else bleached in the solution given above and redeveloped to the correct contrast. If strong contrast is wanted in portions of the image, partial reduction with Farmer's reducer or by the dry friction method (see page 140) should be used. A good density is necessary in the intermediate development operations in order that the negative silver image shall mask the sensitive material behind it. To get the greatest possible screening effect, the intermediate negative images may be treated with uranium intensifier, which gives a heavy red-brown image that effectively masks anything behind it. This has no ultimate effect on the result, since the alkali in the next development removes the intensification completely, and the latter does not affect the printing qualities of the negative at all.

Those who are proficient with brush and colour may prefer an alternative method. After the first exposure and normal development, the negative is dried superficially with a piece of clean leather and the places at which the image is to be shielded from light covered carefully with Photopake. The second exposure is then made, and the colour may be rubbed off during the second development stage with the finger.

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A DREAM WE ALL HAVE. Combination from two exposures. Note that the lower print has been reversed to fit the landscape better.



## CUT-OUT AND PASTE" METHOD

This is the simplest kind of photomontage in theory, but it demands certain practical precautions. If a cut-out is to be stuck down on another print, it is essential that both should be evenly sharp, for unsharp prints have fuzzy contours, and the cut-out will appear obvious in the combined print.

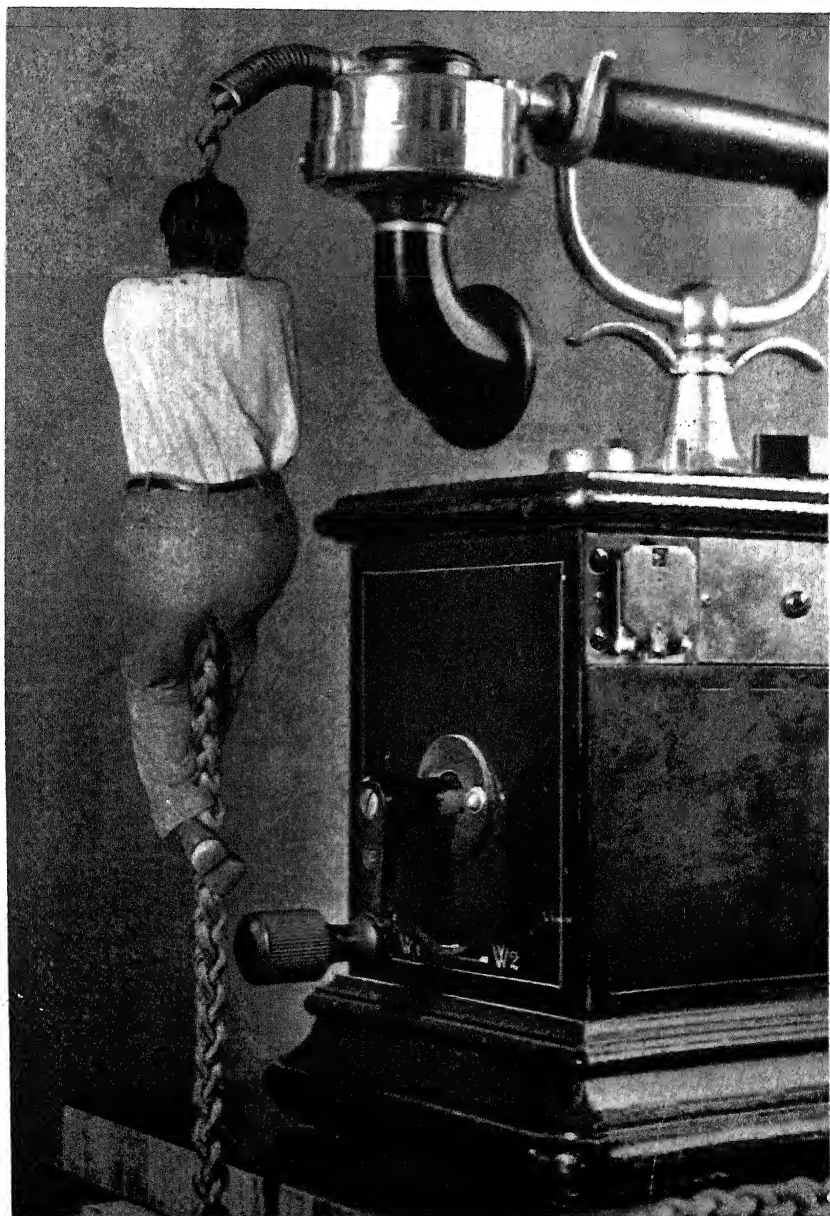
Both prints must have the same contrast and density, and must also be made on paper of the same surface. If this is not done, the duplicate negative made later will make the cut-out obvious to the eye. In this method of photomontage it is very easy to betray the means adopted to combine the pictures, so that considerable care in execution is essential.

To keep the edges thin, a thin printing paper should be used for the print to be cut out, while a sharp knife with a fine point is more suitable than a pair of scissors. The print is placed on a zinc plate or a piece of thick card for cutting. Even the sharpest scissors will always produce points where a break or tear occurs. Fluffy edges must be dealt with by rubbing them on fine sandpaper. The sandpaper should also be used to thin edges of the cut-out in order that they may bed down properly on the print beneath. If this is too much trouble, the edge may be painted black with a fine brush, and the offending contours removed from the copy negative by retouching with pencil. If the edges have remained light, a knife will have to be used on the copy negative.

The pasting must be carefully done, and no "waves" should appear in the print behind. When making the copy negative it is best to put the print and cut-out in a printing frame, which will hold them really flat and will ensure an even shadowless lighting. The last is best produced by using four tubular lamps in the frame, a suitable series of reflectors being provided to stop the light from falling anywhere behind the frame itself. The camera lens can then be placed so that it sees the print to be copied through the central hole of the frame, and will be well shielded from direct light. The frame must be correctly placed at the right distance from the print, in order that no reflections appear on the latter from the position of the camera lens.

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"I'VE BEEN HANGING ON FOR AGES . . ." Two exposures with studio reflex on panchromatic plates.  $f/9$  — 8 seconds with a single Mazda lamp. In order to get the man in the right position, he had to be photographed climbing a beam of appropriate diameter.





## PHOTOMONTAGE IN THE ENLARGER

A vertical enlarger is the most suitable instrument for combination printing, and the results look absolutely natural if the process is properly carried out. The most varied effects are possible, since there is no limit to the number of combinations of two negatives which can be "put together." The principle is that of masking out portions of the print with black paper cut-outs, and the following example should make the process quite clear.

A negative of some waves is in stock, and a picture of a model sailing ship has been made in the studio. The wave negative is first placed in the enlarger carrier, and sharply focussed. On the left and right of the white paper used for focussing are placed two cigar boxes, and a glass plate large enough comfortably to cover the print laid over them. Without moving anything, a piece of black opaque paper is laid on the glass and a line drawn to show the contour of the waves. The paper is now cut carefully along this line, and the two portions of it kept as masks. The side of the mask which will print the waves is used first, and is anchored down on the glass with a small weight. A piece of bromide is then placed on the baseboard and the exposure made. To keep the paper in place it may be pushed up to two drawing pins which act as register stops. Then the bromide paper is removed, the ship negative placed in the enlarger carrier, and the second half of the mask laid on the glass. Only when the two halves of the mask are perfectly in register can a weight be placed on the second to anchor it, and the first half of the mask removed. The bromide paper is then replaced and the ship exposure made after careful focussing.

Combination printing by this method gives soft edges to the "joint," and the farther the glass plate is from the bromide paper, the softer the edge will be.

Clouds may be included in any picture whatever by combination printing. Assuming that the clouds are not too dark in the landscape negative, others may be put in their place without the use of a mask. From a number of suitable cloud negatives, one is chosen in which a strong white cloud is large enough to cover all the important parts of the landscape negative, and the two may then be printed one after the other on bromide paper.

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PIRATE SHIP IN HEAVY SEAS. Wave negative taken with reflex camera,  $f/6.3$  and  $1/1,000$ th second exposure. The ship taken with studio camera,  $f/12$  — 6 seconds.



## COMBINATIONS OF NEGATIVE AND POSITIVE

Simultaneously printing a negative and a positive transparency made from it gives effective results under certain definite circumstances. The process is useful in advertising work, and the prints can be both unusual and arresting.

A transparency is first made from the original negative, and it must be neither too dense nor too hard. A thin soft transparency is the most suitable. After drying, it is placed emulsion to emulsion with the negative. The two images must naturally not be in correct register. By moving one over the other, the separation of the images can be made greater or smaller, and when the right effect has been obtained the two plates are placed in the negative carrier of the enlarger and printed by projection in the usual way. To hold the two in the right position, a touch of gum arabic may be placed on the four corners.

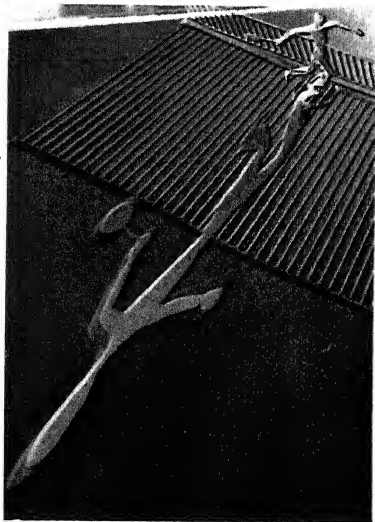
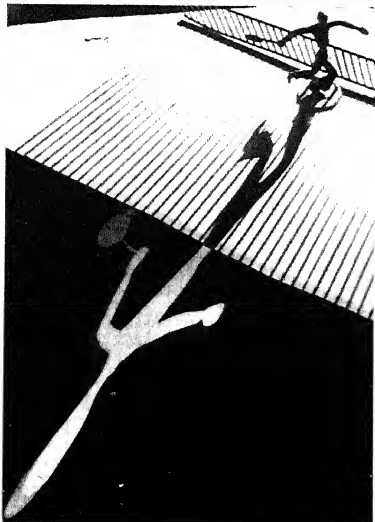
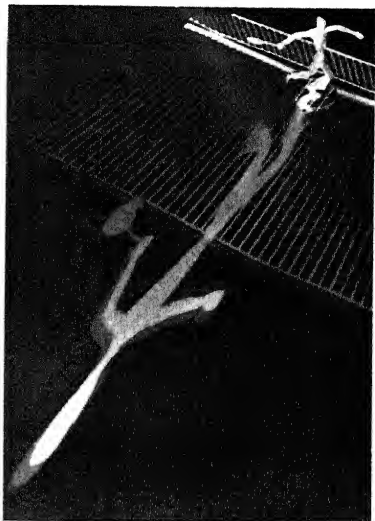
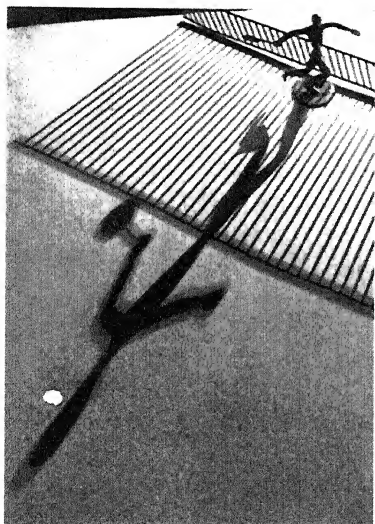
Contact prints cannot be made from the combination, since they would hardly be properly sharp. If it is essential to make a contact print, both negative and transparency should be on film, and the print made in the light-beam from a condenser enlarger.

The appearance of the print depends on the density and contrast of the transparency. A dense transparency brings the general effect nearer to a negative, while a thin transparency has the reverse effect. If both negative and transparent positive are very dense, they will hardly be printable when superimposed. In this case reduction is necessary, though it is better to bleach and redevelop. The last process is quite easily carried out by bleaching the negative and transparency, and then placing them in a soft-working developer in ordinary daylight until they are seen to have reached the right density.

This process is not at all suitable for many subjects. Any object with a good deal of detail merely looks as if the camera had moved during the exposure. A severe and simple subject with a short scale of tones is essential for good results, and the series of illustrations opposite shows some of the possible results.

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FOUR KINDS OF TENNIS. The two upper pictures show prints from the negative and transparency. The left-hand lower picture shows its upper half positive and lower half negative, while in the fourth negative and transparency have been enlarged out of register.



## THE WORLD ON YOUR TABLE

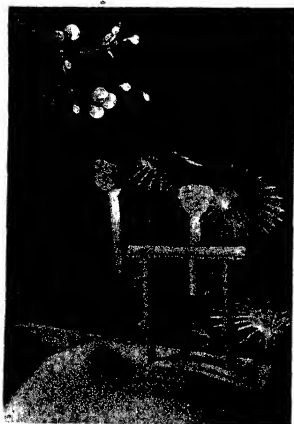
A field in which all ordinary barriers of time and space are removed from photography is that of making up small scenes and landscapes on a table-top. Those who have a sense of humour and a little manual dexterity can produce the most incredible results from practically nothing. The film industry, too, commonly uses miniatures, just because it is so much cheaper to build small than in full size.

The various necessities are obtained in the simplest way imaginable. Snow, for example, is made from powdered alum, or from sodium phosphate mixed with chalk and rubbed through a sieve.

Hills are made from bird-sand, rocks and cliffs from lumps of coal, icebergs and flocs from large crystals of washing soda, and leafless trees from grape-stalks.

Water is well imitated by cellophane, while puddles and pools can be made of candlegrease.

Various dolls and their furniture may be included in the scene to give effect, and a series of photographs telling a short story is not very difficult to make. Short stories are particularly happily handled by "table-top" method, for the action of the plot appears to bring the inanimate objects portrayed, to life, and to show them in "action".



In work of this kind, it is important to use a lens of short focal length in order to get sufficient depth of focus. The chief danger to be guarded against is that of conflicting styles. Everything that is included in one scene should be chosen to give a really suitable impression, for conflicting details in style will spoil the whole picture by cutting it up into small sections.

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THE LAND OF CHERRY BLOSSOM. Studio camera and orthochromatic plate.  $f/18$  — 12 seconds exposure with two Mazda lamps.



## CELLOPHANE LOOKS LIKE WATER

Photography is a realistic art—it can only concern itself with such objects as exist materially, and the attitude of the lens is objective to an extreme. It is difficult to cheat the camera, for the lens shows too much detail, so that any deception must be made on the mind of the observer, who is led to believe that the camera has seen what it actually has not.

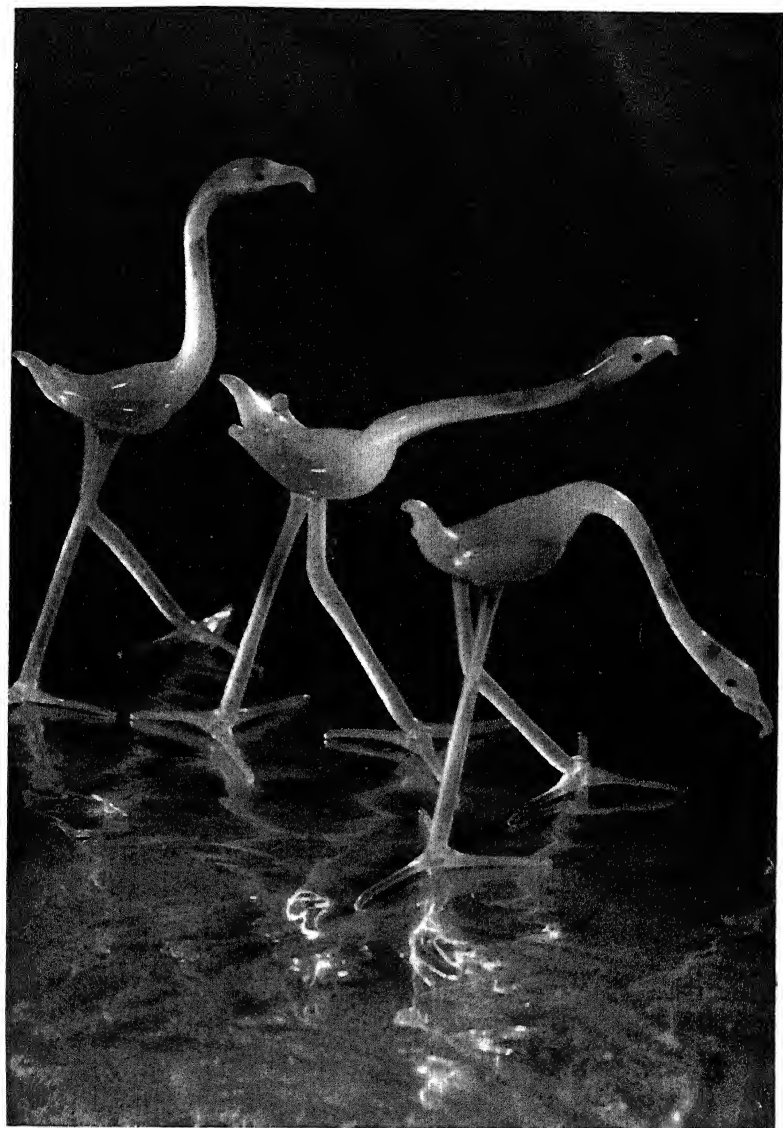
There is often some small point—not pictorial in character, though possibly important from the point of view of visual perception—in which a table-top scene leaves something to be desired. To put this right, an alteration can, as a rule, only be made to the background or surface on which the scene is built. Thus, we use cellophane for water or puddles, but the trouble is that anything wet has high-lights and is seldom in a state of quiet.

This may be remedied by steaming the sheet of cellophane over a kettle until it is thoroughly elastic, and then nailing it stretched out on a board so that it dries and cools as irregularly as possible. The irregularities will serve as ripples and waves later on. Large waves are made by stretching the sheet locally with the fingers, while the smaller ones are produced by stretching on the board without any further attention.

For the exposure, the objects are placed on the sheet, and the effect is one of them actually standing in water. By a suitable choice of the colour of the paper placed under the cellophane, clear or muddy water can be imitated.



(Right) GLASS BIRDS. (Above) BATHING BELLES. Studio camera and panchromatic film.  $f/36$  — 1 minute exposure in artificial light.



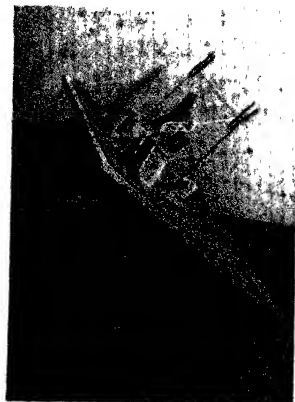


## THE THINGS YOU DON'T SEE

Good pictures are usually distinguished by some originality in execution, and they sometimes attract those who see them (assuming that they have some knowledge of photography) because the way in which they were taken is not obvious. It is consequently good to make puzzling pictures of this kind from time to time, because it is just as much trouble and excellent practice to the photographer to think out ways and means as it is for the observer to find out how the work was done. There are a number of devices that may be put to good use in this connection, though the correct one must naturally be chosen to suit the occasion.

As an example, take a photograph showing a house of cards collapsing. It would certainly be most difficult to get an ordinary photograph of this process, particularly if every card were to be shown needle-sharp. The problem is thus one of finding some way in which the cards can be stopped at the right moment.

This may be done by taking a board as a base for the card house. The board, however, is tilted instead of being horizontal, and has a glass sheet fixed to it at right angles. The cards can then be built up against the glass, and the camera, naturally tilted to the same angle as the board, shows them apparently collapsing from an upright position. Falling crockery can be photographed just as easily in the same way.



A black background in place of the glass sheet is also suitable and black plasticine will help to support the various cards or other objects on it. Taut black thread can also be used, and with a short enough exposure, the plasticine and thread will disappear into the background.

In order to avoid the necessity for retouching, a contrasty negative material is best used, on which the black threads or other accessories for these problem pictures make virtually no impression at all, and thus do not appear in the picture.

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A CARD HOUSE COLLAPSING. Studio camera and panchromatic film. *f*/50, light green filter, with 45 seconds exposure to four Mazda lamps.



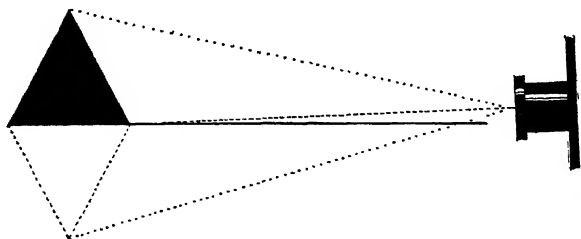
## “FATA MORGANA”

Mirages or “Fata Morgana” are due to total reflection by air strata at different temperatures, and are really optical illusions. The reflection effect can be seen on roads in hot weather, but the true mirage only appears in the desert or at sea. Photographs have frequently been made of the phenomena, particularly in the plains of Hungary. On a small scale, artificial mirages may be produced by means of an accurately levelled sheet of tin-plate heated from below in still air. After heating a short time, a mirage can be observed by placing the eye at one end of the plate and looking towards the other end. Since the air and not the tin-plate should reflect, it is best to make a miniature desert by spreading a thin layer of bird-sand on the tin. The “desert” so formed can be made to be part of a picture placed at the other end of the metal sheet.

To photograph the mirage effect, an enlargement is placed at the far end of the tin-plate and the camera focussed on it from the near end. The camera axis should be inclined at an angle of three or four degrees to the plane of the tin-plate sheet. The rest of the technicalities are those of the copying process, except that the plate is between the camera and the print. To get sufficient depth of focus, the lens must naturally be well stopped down. The shorter the focal length of lens used, the better, in this case.

Mirages may also be produced by double-printing in the enlarger. Two masks are used, and the negative is turned over for the second exposure.

The simple enlargement of a single negative with a mirror will not produce this effect, since the sky will then appear in the place where the foreground ought to be.



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MIRAGES IN THE DESERT AND OVER THE SEA.



## HOKUS-POKUS WITH TRAFFIC

It is an unusual thing to find the streets of a large city completely devoid of traffic and pedestrians, and anyone who finds a busy street empty in the rush hours may well be greatly surprised. It is not difficult, though, to empty the streets with the camera, for this instrument can equally well record a single short phase of movement, or add together a large number of short phases to a single picture. In the latter case, only the stationary and permanent parts of the picture will appear in the print.

The question is thus one of arranging the exposure to be as long in time as possible, and this is conveniently done by stopping down the lens greatly and using a slow plate or film. A neutral density filter (made by several firms) can also be used to increase the exposure time.

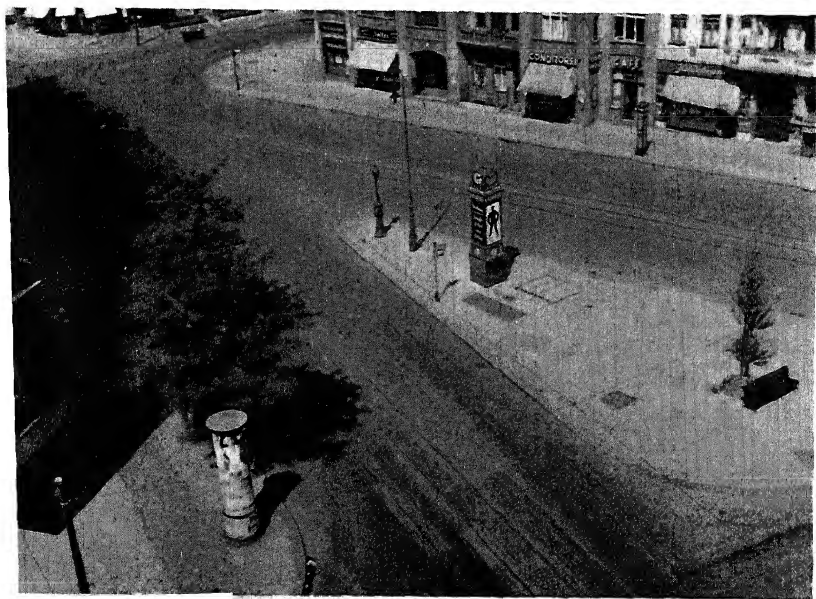
There is always the risk that a car may be parked in the street below for a longer time than the exposure itself, and it often happens that it is better to cut up the exposure into a series of shorter exposures given one after the other. The sum exposure time of these short exposures must be considerably greater than that of the single long exposure, since the effect of the light is reduced when the exposure is intermittent instead of continuous.

It is always possible that a number of cars will park at the same in the street one after another, and that the second exposure will be much delayed. One should not wait a very long time for it, however, and a little luck is always necessary in this field of work. Waiting too long means that the sun will move, and with it the shadows of the scene. Thus, by waiting a long time between exposures, the shadows will move so far that the final image will have no shadows at all, and appear to be flatly lit.

As the shutter has to be re-set repeatedly, a very firm support for the camera is essential so that it remains unmoved during all the exposures. In order to avoid any possibility of fogging which might result from the lengthy exposure time, it is advisable to cover the dark-slide with the focussing cloth or use a cardboard cap for the same purpose.

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SAME STREET—SAME TIME. Two photographs taken one after the other. The top one was given  $f/9$  and  $1/50$ th second, while the lower one received 30 short exposures of  $1/250$ th second each at  $f/22$ .



## EMPTY SKIES

Those who have not tried combination printing in the enlarger, but would like to experiment on a simple example, are recommended to try printing in an aeroplane or bird into the sky of some negative that has an empty appearance. This is the simplest form of the process, but even here a few precautions must be observed.

It is necessary, in the first place, to have the right sort of negative of the aeroplane or bird. They should appear white against a very dark sky or dark against a very white sky, and according to the landscape negative in use one or other will probably be suitable. A landscape with a dark sky would thus be used with the negative showing a light object also against a dark sky.

In this case, the two negatives are merely placed emulsion to emulsion, and enlarged together. Since the aeroplane or bird negative has practically no density in the sky tones, the landscape negative will print through it without difficulty. The extra density is not important, for it only means that a little more exposure must be given. The increase in density must not, though, be so great that the sum of the two negative densities is very high, so that the two negatives must be kept soft and relatively thin.

To print an aeroplane on a landscape with a light sky, it is necessary to block out the sky on the aeroplane negative if the sky densities are not very heavy. After this, the landscape negative is first exposed, and then a second exposure of the aeroplane given by changing the negatives in the carrier. Since the latter negative will be practically black, the landscape image printed first will not be affected by the enlarging lamp. After the two exposures, the print is developed and finished in the ordinary way. It is obvious that the two printing exposures must be accurately adjusted to one another, and in doing so it must be remembered that the slight degree of exposure which the sky has received will reduce the exposure needed for the negative of the aeroplane.

When taking photographs specially for printing in, matters can be considerably simplified by taking the aeroplane or bird negative against a deep blue sky with a red filter, and the landscape negative on a contrasty orthochromatic emulsion without a filter.

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DIRTY WEATHER. Reflex camera and orthochromatic film.  $f/9 - \frac{1}{600}$ th second exposure. Original above, printed in with two birds below.





## THOSE BLURRED FOREGROUNDS

Everyone knows that as soon as a photograph is to be taken in a public thoroughfare somebody runs into the foreground and appears as a dark shadow, well out of focus. Since photographers are in a minority in the streets, they cannot expect to be considered at the expense of others, and must make the best of things as they are. Even in a carefully chosen position where nobody can be really expected to get in the way of the camera, someone is sure to appear at the wrong moment and rush in front of it just as the shutter release is pressed. The only thing to be done is to try to improve matters afterwards as far as this is possible.

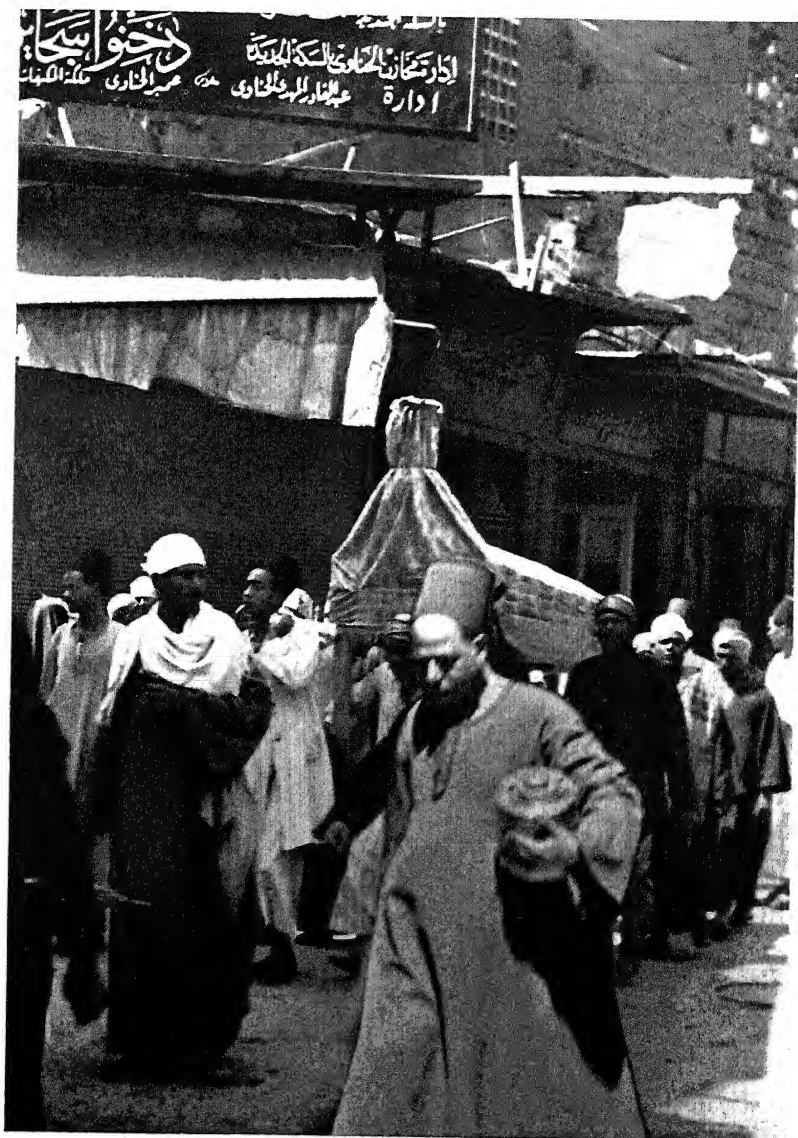
Accordingly, a foreground suitable for the background of the spoiled picture is looked out from the negative file, and a print made of it in an appropriate size. The correct part of this print is then cut out and pasted down on the background so that the offending person is covered completely. Other things than human beings can be used as suitable foregrounds: foliage, bushes, walls, or anything that matches the background and suits the style of the original print. <sup>1</sup>For this reason, it is wise to make a collection of suitable foregrounds that may be useful in emergencies later on.



If the picture will stand a completely black silhouette for a foreground, a suitable foreground negative can be printed in without the trouble of cutting out and pasting. The exposure should be arranged so that the new foreground is completely black, so that it will not be necessary to make a new copy negative and print from it. The most important point of all is that the foreground should be just as sharp as the objects surrounding it.

If this is not the case, then a sharp foreground negative should be printed over one that has a background which is out of focus, in order to get the required depth of perspective.

MOHAMMEDAN FUNERAL. Reflex camera and panchromatic plate.  $f/6.3$ — $\frac{1}{100}$ th second exposure.



## UNWANTED BACKGROUNDS

In photography, the means of personal expression are relatively limited, and there are comparatively few experts who are able to strike a personal note in the matter of style. The particular motive or feeling in the picture must be brought forcibly to the observer so that it holds his attention completely, and one may say in general that the longer the print holds our interest the more satisfactory a picture it must be considered.

The effect of any photograph depends very largely on the background included in it, for the less arresting the background is, the more prominence is given to the main object of the picture. For this reason it is quite often desirable to differentiate the background and foreground from one another. Such a process is not in any way confined to the specialist with unlimited technical facilities, but can be done quite simply as described below.

In the first place, it must be decided whether the background is to be lighter or darker in tone than the foreground, and in each case it will be necessary to alter the background uniformly, not in patches. Patches often occur if a dense sky is reduced locally with a brush. (See page 140.)

It is better to cover the foreground subjects completely by painting them over very carefully with waterproof negative varnish, asphaltum varnish, or etching ground. If the background is wanted darker, the whole negative is then treated with Farmer's reducer; if lighter, the negative is immersed in a solution of neococcin or diluted red ink. The varnish will protect the foreground from the action of either solution, and after the negative has been dried the varnish layer may be removed by dissolving it in benzine, turpentine, or some other appropriate solvent. With transparent varnishes, there is no need to do this, since the image prints through them. It is frequently necessary to retouch the negative to cover any traces of fuzzy edges which may appear.

In all cases a slight lightening or darkening of the background is much better than a pronounced one. After all, the whole process is an interference with the tones of the picture, and it should not be more noticeable than can be avoided.

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BREAKFAST IN DAMASKUS. Showing the effect of altering the tones of the background on the main subject of the picture.  $f/4.5-1/_{100}$  second exposure.



## LOCAL REDUCTION

In spite of the finest gradation that a modern film will give, and in spite of all the compensated developers on the market, it is by no means uncommon to find that a negative has high-lights so dense that they print to a chalky white tone. Softer printing paper is no help here, for the gradation of the rest of the image is lost in printing in the high-lights. In such cases, part of the image only must be reduced: hence the term "local" reduction.

There are various methods possible: if the offending part of the negative is at the edge, the plate or film may be held obliquely over a developing dish (tray) and Farmer's solution run over it locally from a pledget of cotton wool. There is no risk of the other portions of the image being affected. If the dense portion is in the centre of the negative, it is better to use a soft paint-brush to apply the reducer, but here it is essential that the negative shall be continually washed in clean water in order to get rid of the superfluous reducing solution.

Instead of buying ready-made reducers, a 2% solution of potassium ferricyanide may be used instead, though in this case the negative must be bathed in hypo solution several times during the process, for the fixing solution really completes the reducing. The advantage of this method is that the reducer does not decompose while it is being used.

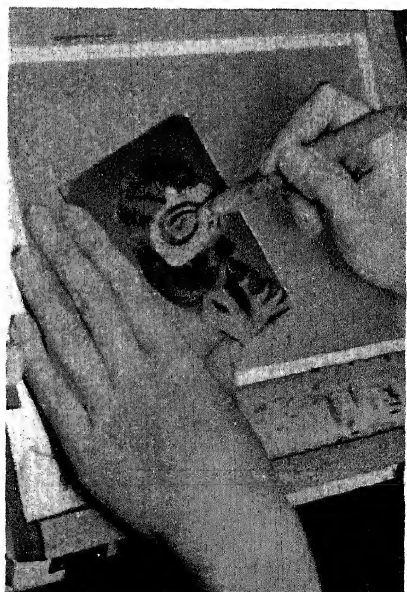
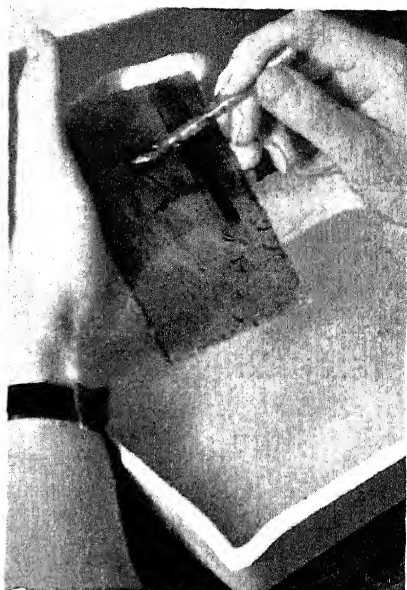
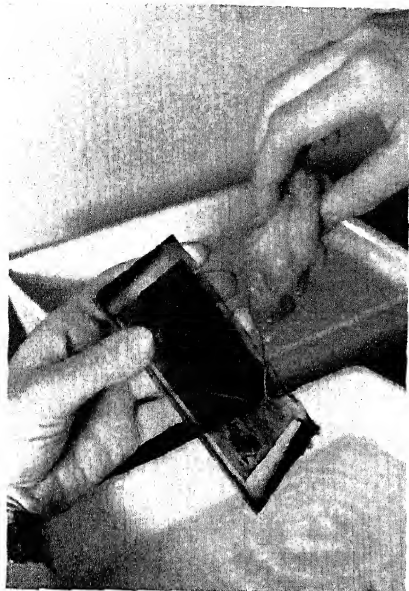
Where contours with fine detail must be reduced, it is best to use a glycerine reducer. This has the same composition as a normal reducer, except that the chemicals are dissolved in glycerine instead of water, and the resulting treacly and viscous solution stays where it is put on the emulsion.

Dry reduction of a negative by friction is also possible. For this process the negative is best placed on a retouching desk, and a fine abrasive such as silver polish applied to the offending high-lights with a papier-mâché stump such as is used for charcoal drawings. As soon as reduction is complete, the surplus polish is wiped off and the negative surface polished with a piece of cotton wool.

Scratches and fingerprints can also be removed by the dry reduction method.

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LOCAL REDUCTION. Top left: reduction at the edge of the negative. Top right: local reduction in the centre of the negative. Bottom right: dry reduction with silver polish.

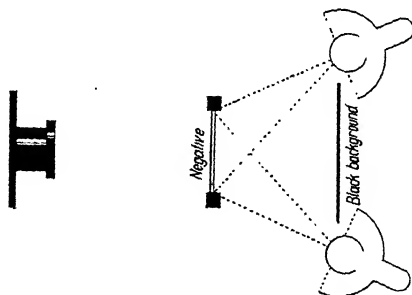


## WHEN EVEN INTENSIFICATION IS NOT ENOUGH

In cases where the exposure was far too short and only the faintest ghost of an image appears in the negative, there is one possible way of putting matters right. This consists of copying the negative in what the photo-micrographer would call "dark-ground" illumination.

The negative to be copied is placed in a frame with very wide sides so that the necessary back-light does not reach the camera, and at the far side of it from the camera are placed two half-watt lamps in reflectors, their light falling obliquely at a steep angle on the negative in the frame. A little experiment will soon show the best position for them. Behind the negative and in the optical field of the camera is placed either a piece of dead black card or a stretched sheet of black velvet, as shown in the sketch below. Looking into the ground glass, a positive image will be seen, for any point on the negative where a trace of silver was developed will scatter the light and shine white, while the clear places of the negative will be black since the black background is seen through them. An even stronger positive image can be obtained by bleaching the negative in mercuric chloride, when the deposited silver becomes white instead of grey.

It is obvious that only the softest and thinnest images, free from fog, can be copied and made printable by this method. The merest trace of fog, or a very flat negative, makes this process impossible, for it is then impossible to see a proper visible white image on the original.



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GLAZIER AT WORK. The upper negative was accidentally developed in a much diluted compensated developer, and showed far too little density to give a satisfactory print.





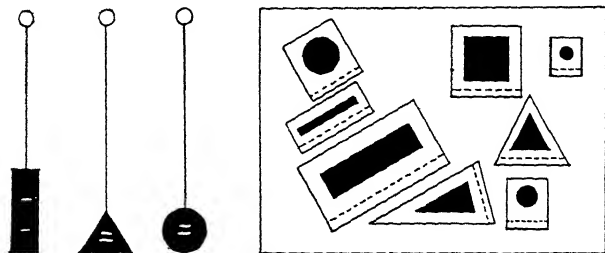
## SHADING AND MASKING IN THE ENLARGER

A considerable number of negatives do not show the details in all their tones as well as one could desire. Some have too dense high-lights, others too thin shadows, and the resulting print is not as good as it should be. Even the choice of another paper grade, or variations on the developer, is not infrequently of little help.

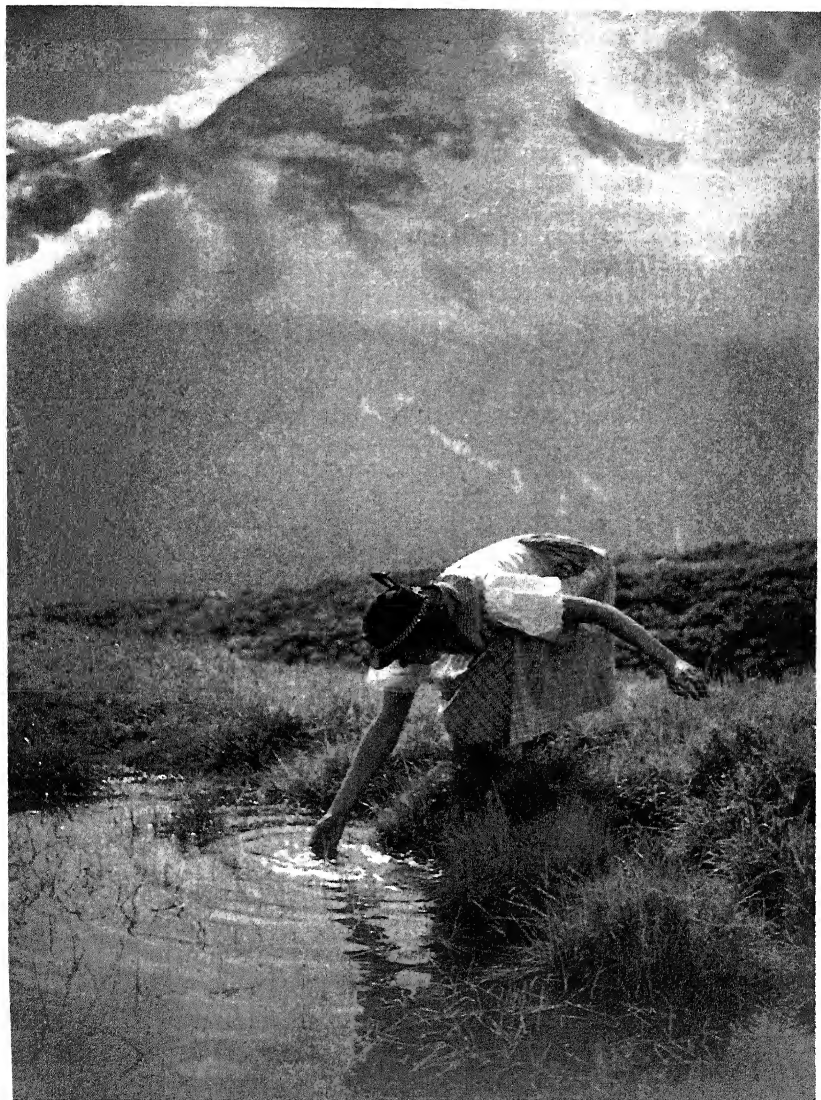
One of the greatest advantages of enlarging over contact printing is the inherent possibility of local treatment during exposure. It is not necessary to use a soft paper just because dense high-lights are present in an otherwise flat negative. Hard paper can be perfectly satisfactorily used provided that the dense portion of the negative is given extra exposure.

This is done by cutting a hole to the approximate shape of the dense part of the negative in a large sheet of black card, and placing the sheet in the way of the light-beam so that only the dense portion is given extra exposure. Different sizes and shapes of holes will naturally be required in different cases, and it is useful to cut out from a large cardboard sheet a number of squares, triangles, and circles. Over these holes are stuck flaps of black paper, so that the appropriate hole can be opened when it is wanted. The amount of the image covered is naturally varied by moving the masks nearer to or farther from the bromide paper on the enlarging easel.

Other solid shapes may be cut from black paper and spiked on thin wires, so that the central portions of the image may be "held back" during exposure.



A MOUNTAIN POOL. Folding plate camera and panchromatic plate.  $f/9$ , 2 X yellow filter and  $\frac{1}{50}$ th second exposure.



## HIGH-KEY PRINTS

The term "High-Key" originated in America, and implies a print with a particular light and soft quality. Every subject is not suitable for the process, and only certain types of scenes look well in a soft print without full shadows. Soft-focus negatives are particularly suitable as a rule, for this effect is best reproduced in high-key prints. Misty effects are particularly attractive in high-key, since all the fine gradations in their light tones can be shown. As a further example, one might mention the reproduction of white velvet or satin, which show very small differences of tone in their folds and waves.

A soft light print cannot be produced by cutting short the development time of an ordinary bromide print, as the grey image resulting is anything but high-key in character. In spite of the softness and lightness, the image tone must be pleasant. This may be done by finding the exposure needed to produce a normal print in an ordinary developer, and then giving double this exposure to the paper. The print so made is developed in a special solution containing only one-tenth the weight of the developing agent present in a developer of normal formula. This naturally involves a very long development time. Compensated negative developers may also be used if they are considerably diluted, but they do not give such pleasant tones, for not all such developers are suited to the process. All developers, in fact, which contain a solvent of silver salts or include pyrocatechin, are unsuitable because they give a dirty print or unpleasant tone.

Since there is a risk of yellow fog with prolonged development, it is useful to include in the developer some anti-fogging substance such as "Bellaton." In warm weather high-key prints should not be made at all, for the risk of fog is too great. If it is essential to produce them, 5% of chrome alum should be added to the fixing bath, and the print rinsed in an acetic acid stop bath between development and fixing. It is also useful to include 10% of Glauber's salts in the developer, since this stops the gelatine from swelling excessively. (2 ounces of crystalline Glauber's salt or sodium sulphate to each 20 fluid ounces of developer.)

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HOLIDAY TIME. Reflex camera and panchromatic film.  $f/6.3$ , light yellow filter, and  $\frac{1}{320}$ th second exposure. Bright sunlight.



## MAKING PRINTING SCREENS YOURSELF

Although a variety of quite good printing screens is on the market, it is good practice to make one's own, for by choosing a special screen some really personal results can be obtained. Screens are quite simply made in a number of ways. Photographic methods imply copying the surface of some material, such as leather, papers of various kinds, or the parchment used for making lamp-shades. To bring up irregularities in the surface, as in the case of embossed paper, it is useful to dust a little graphite powder on a hard ball of cloth and rub the paper lightly so that the "hills" are darkened while the "valleys" remain unaffected. The paper is then photographed on a large negative (preferably film), big enough in area to cover the biggest enlargement to be made. Plates are not so suitable because they are too thick to give a good contact print when the negative is placed over them. If no large camera is at hand, the paper is photographed on a small scale, and enlarged up on a sheet of negative paper as used by process workers.

Reflex copies are also satisfactory. An embossed paper is rubbed with graphite, and a thin bromide paper (negative paper is better still) exposed on it by the reflex process. After developing and finishing, the paper is made transparent by soaking it in a mixture of refined paraffin and petrol in equal volumes. Screens made in this way have the advantage of only showing weakly in the print.

Screens may also be made by ordinary printing. A squeegee charged with bromoil or printer's ink is run over the surface of the paper to be copied, and the screen then made by rolling the inked sheet with tracing paper in a domestic mangle. This transfers the ink to the tracing paper.

Any paper that has a suitable structure for a printing screen can be made transparent by painting it over with the following solution: 9 parts (by weight) venetian turpentine, 12 parts light colophony, 5 parts wax, 150 parts rectified turpentine, and 50 parts linseed oil varnish, mixed thoroughly together and applied when at a temperature of 120° F. (50° C.)

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OLD PRAGUE. Folding camera and orthochromatic plate.  $f/9$  —  $1/25$ th second exposure. An ink-printed screen was used for enlarging.



## GRAPHIC OUTLINES

There is an unusual method of producing original results which is particularly popular in France. The print gives the impression that a black line has been drawn round the main contours of the objects shown.

There are two main ways of getting this result: the simplest is clearly that of painting in the desired line round the main objects in the picture, and then washing out the hard edges to soften the effect. This is naturally a delicate and tedious business.

It has also been suggested that a negative and transparency could be printed out of register to produce the same effect. This would admittedly produce a black line, but it would not be the same thickness all round the main subject. At the same time, lines of this sort would appear very hard in the print, and would give the impression that all the parts of the picture were rigidly separated into different planes.

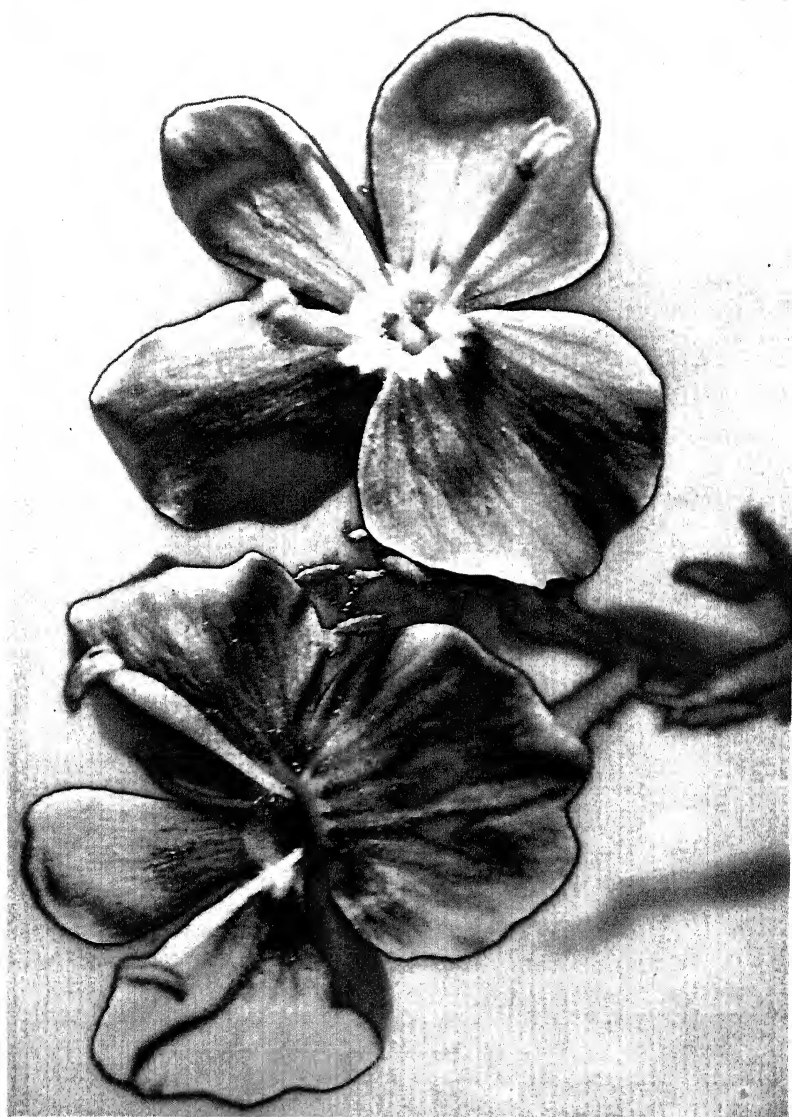
With modern panchromatic material, a much simpler method can be used. After the plate of film has been developing for some three minutes, the red dark-room light is turned on for a few seconds, then turned out again, and development continued. It will be found after fixing that those portions of the image which had not developed black before fogging have been reversed from a negative to a positive, and if the development after fogging has not been too long the desired black line will appear.

For the best results, one must work with one type of negative material and with one developer formula. The development times, and the duration of the second exposure, must be rigidly adhered to for one particular temperature of development.

Since the fogging principally affects those portions of the image in which the original subject was dark, the composition of the subject must include plenty of shadows, for otherwise the effect will not be a strong one. It should also be noted that only simple lines are suitable for the composition of pictures developed in this unusual way.

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FLOWER STUDY. Studio reflex camera and panchromatic film  $f/9 - \frac{1}{10}$  second exposure. The subject was actually placed in front of a black background.



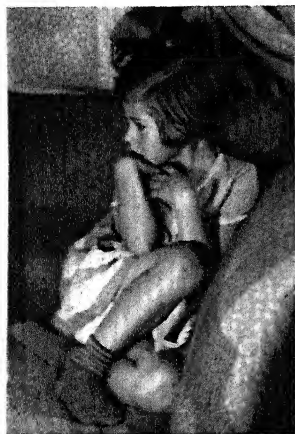


## PHOTO-ETCHINGS

The difference between an etching and a drawing is obvious even to those who have no knowledge of art, for in spite of the superficial similarity of the two the needle of the etching can always be identified from the character of the lines. Etchings have, in fact, a characteristic warm appearance.

To the photographer, the production of etchings is not very difficult, for a formalin-hardened glazed print may be used as a plate instead of the usual copper sheet. To make the work easier, the print should be mounted on thick card, but no moist paste can be used, as this would affect the glazed surface.

The only tool required is an engraving needle, which can be made quite simply by grinding a gramophone needle to a triangular point on an oilstone and setting it in a handle. The needle must be so sharp that it cuts the gelatine cleanly without flaking it away from the paper base of the print and causing a bad line. The outlines of the objects in the print are first engraved in, and then the shading can be started. To examine the progress of the work, the print is held so that the light catches the glazed surface, and the lines can then be clearly seen.



Finally, the print is rubbed over with cloth charged with printer's ink or bromoid ink, softened with a few drops of turpentine, and the excess rubbed from the surface with a soft flannel rag. The lines are now filled with ink, and a piece of thin paper slightly damped with turpentine can be laid over the print. The two are then placed between boards and run through a press. Alternatively, the paper used to take the print may be soaked in petrol (with adequate precautions against fire), and the

two pressed together in an ordinary printing frame. After some time the petrol will soak the printer's ink out from the "plate" and on to the paper.



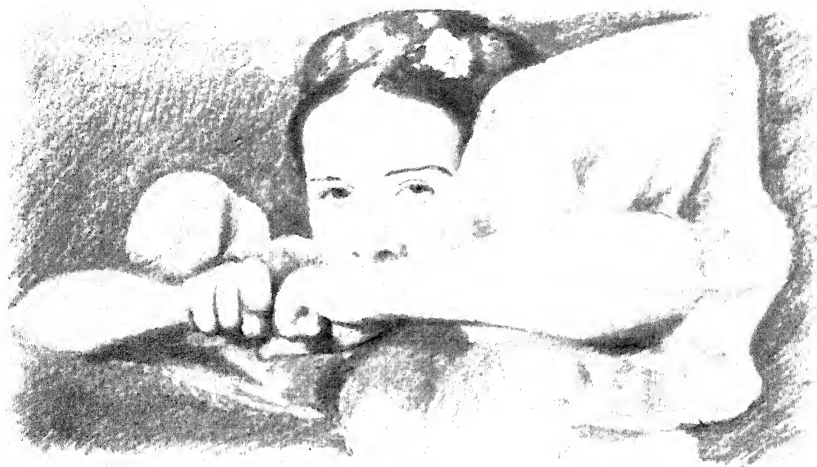
## PENCIL DRAWINGS — WITH THE CAMERA

The nearest graphic art in appearance to a photographic print is that of drawing. Whether chalk, pencil, or charcoal is used, an indefinitely large number of different grey tones can be produced between black and white. The similarity suggests that it may be possible to transpose an image from one medium to the other, and though this technique may at first appear illegitimate, it must be remembered that quite a number of artists use photographs as a basis for their work, so there is no valid reason why photographers should not make drawings from their prints. The style of the result must of course be independent of the means adopted to transpose the image, so that the following notes concern technique only.

It is quite possible to use a piece of tracing paper over a print and draw on it with a pencil. This is not an easy way of doing the work, for the details are hard to see through the tracing paper, and the half-tones in particular are very difficult to judge. The change from light to shadow is thus inclined to be much too sudden in the drawing.

A far better method is the following, by means of which any size of drawing and any kind of paper are possible. The negative is placed in the enlarger carrier, and its image projected in the required size on a piece of drawing paper. Then, with pencil, crayon, or charcoal, the light parts of the image are darkened until the entire surface of the drawing paper appears as an approximately uniform dark tone. This will mean that the most transparent parts of the negative are strongly blackened on the paper below, while the high-lights are hardly touched at all. The work must naturally be done in a darkened room, and the best way of finding out how the work is going is to turn on the ordinary room light. This is usually necessary because minor alterations are nearly always wanted. The drawing is finished when it is impossible to see any further details in the darkness with the photographic image projected on to the paper.

A slightly rough paper is the best for the drawing. As the work is done more or less in the dark, the grain of the paper will produce some kind of image structure without any attention from the photographer. Without some kind of image structure, or where the pencil lines are not clearly visible, a drawing is useless. If no care is taken of this point, it is very easy to get drawings that merely look like a much retouched photograph.



## PEN DRAWINGS FROM PHOTOGRAPHS

With a little experience pen drawings can also be made from photographs by those who have no real talent for drawing. The only important thing is a steady hand and a capacity for drawing straight lines with the pen.

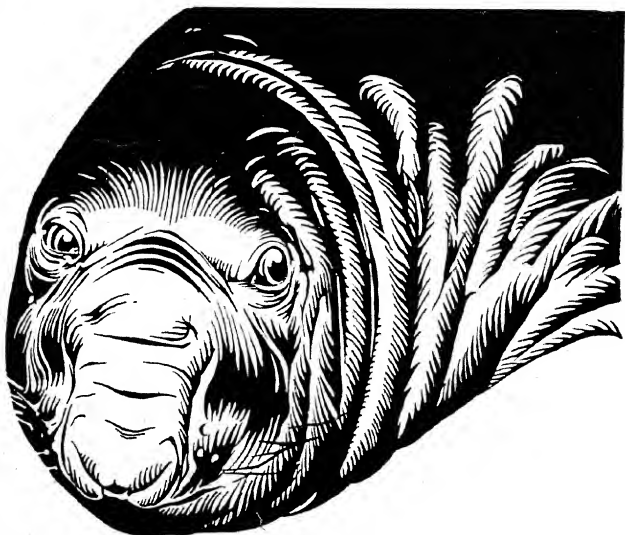
A lightly printed bromide is first made on glossy paper. Rough matt papers make drawing easier, but a glossy surface takes finer lines. Glazed surfaces are very sensitive to fingermarks, and the least trace of grease will cause the ink to run into dots instead of "taking" properly. If fine lines are found difficult, an enlargement can be made and a coarser pen used.

The drawing itself is done with a soft "lithographic" nib, and synthetic black inks are usually better than the "indian" or "chinese" inks. Since the ink wets the gelatine and swells it, the pen cannot be used to join two wet lines or the print will be damaged. The style of the drawing is important and one should decide at the outset whether a large number of fine lines are to be used or a broad and heavy effect, for the same treatment must be given to the whole image.

The blackening of large areas can comfortably be left until the print has been bleached, as this will save time. As soon as the most important lines of the print have been inked over, the ink is allowed to dry and the print then bleached in Farmer's reducer (3 parts of 10% potassium ferricyanide solution mixed with 10 parts of 10% hypo solution), thoroughly washed, and dried. The large areas can then be inked in, and any necessary improvements effected.

To get the best possible result, the drawing should be copied in the camera, and a contrasty print made. The original drawing will usually show surface irregularities if the light strikes it obliquely, which are naturally due to the local effect of the ink on the emulsion.

Where it is desired to produce an even grey tone in the picture, the print — after bleaching — may be painted with varnish or celluloid solution over all those parts that are to remain white. The print is then steeped in diluted red ink, and after drying the varnish is removed with benzine or amyl acetate. An image in black, white, and red tones is now at hand, and in printing the reds will become grey. The stronger the ink solution, and the less sensitive to red the plate used for copying, the darker will this grey tone be.



## BETTER MODELING

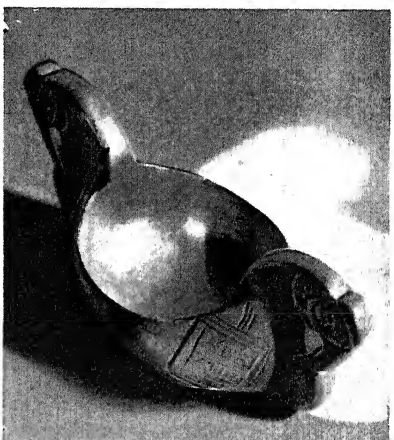
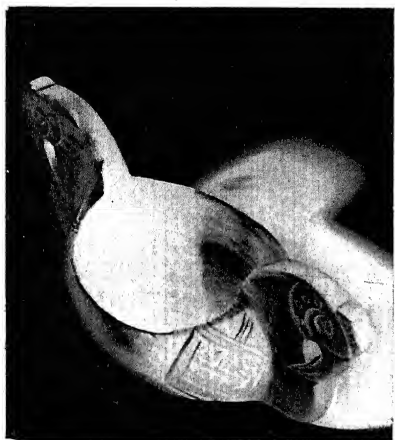
For many purposes a special process is useful, which—even if it cannot be used with every subject—does at least give unusually satisfactory results by increasing modelling and perspective effect. This process is only possible with inanimate objects, for it is necessary to take two exposures without moving the camera or the subject.

The first exposure is made with a strong left-hand lighting, and the second with the light dead on the right. The two exposures and the distance of the lamp from the subject must be the same in each case, and the two negatives should be equally and simultaneously developed. After they are dry, a transparency positive is made from the negative with the left-hand side lighting, the positive image being sharp, soft in contrast, and of comparatively low density. This is then placed emulsion to emulsion with the negative with right-hand lighting, and the two moved until they are dead in register. A projection print of the two will then show (provided that the work has been properly done) greatly increased modelling and perspective, for the shadows have become deeper and the lights have broadened. The subject thus stands out against the background much more satisfactorily. This technique does not give anything like a true-to-life rendering of the surface texture of the subject, but the effect is often much better than that of a normal print. Deep cavities, which are always difficult to light properly, and are often merely black shadows without detail, can be quite simply lightened by this process. It is also possible to remove objects from their background in a similar manner, and cause them to appear alone.

In the illustrations opposite, the top left shows the left-hand lighting and the top right the right-hand lighting, in which the shadows should be noted. The bottom left picture is a print from the transparency made from the negative above it, and the bottom right picture shows the combined effect of negative and transparency positive. The increase in modelling is obvious, but one must not object to black and white shadows appearing simultaneously in the same print.

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CARVED WOODEN BOWL. The "negative shadows" are clearly seen in the lower right-hand picture.





## LUMINOUS PHOTOGRAPHS

To make photographic pictures which appear luminous in the dark it is best to use the process described on page 164, except that a luminous plate is used instead of a metal surface. The preparation of the luminous plate is as follows.

A sheet of fixed and washed, but not hardened, printing paper is blotted with a piece of photographic blotting until its surface is tacky. Luminous powder is then spread over it by rubbing it through a sieve with a brush, and the sheet left to dry in a horizontal position. The powder will adhere to the paper. (Luminous powder may either be bought or made at home.)

A luminous paper of this kind may be printed under a transparent positive in the sun, and when the positive is removed from it in the dark the image will glow clearly. This effect can only be produced once, since as soon as the luminous sheet is exposed to light again it will glow uniformly all over its surface. For a permanent effect it must be mounted in register behind the transparency positive. Since calcium sulphide, an important constituent of most luminous paints and powders, decomposes photographic images, the positive should be well varnished (preferably with cellulose varnish) before the two are mounted in contact. Negative paper can also be used as a substitute for a positive plate with equally satisfactory results.

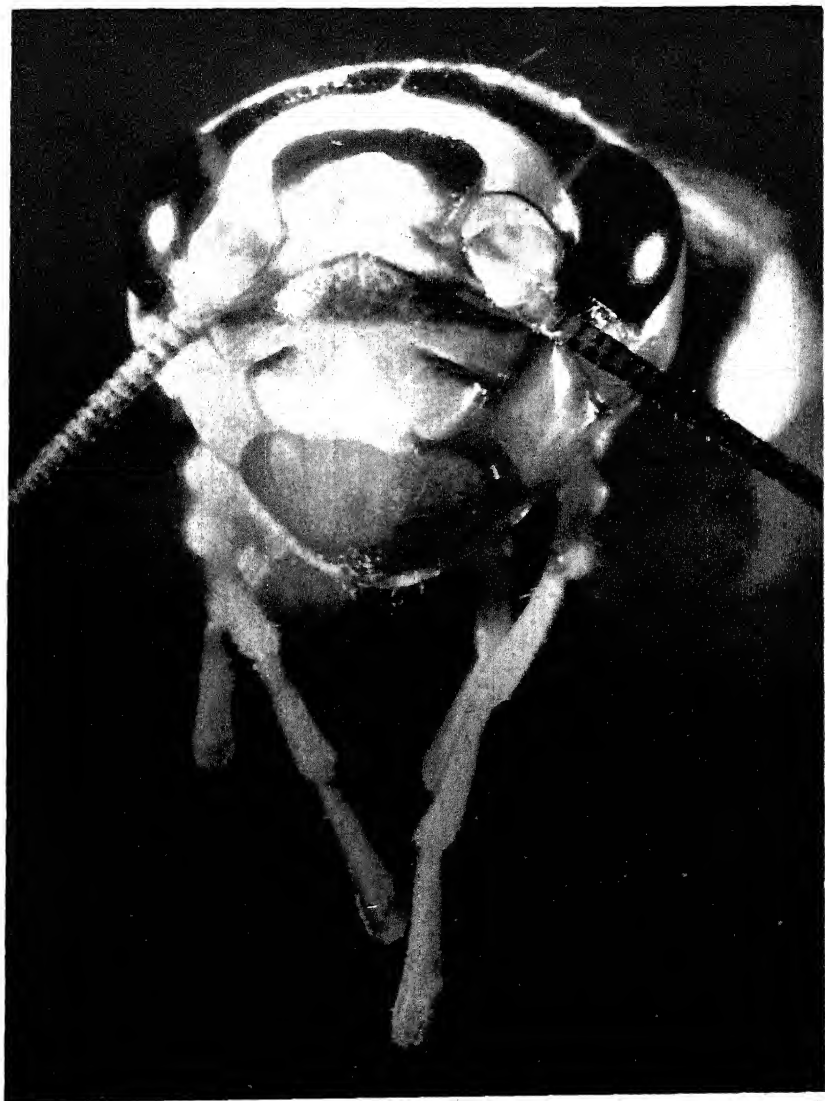
Formulae for luminous powders.

	Red parts	Yellow parts	Blue parts
Barium carbonate . . . . .	400	—	—
Strontium carbonate . . . . .	—	400	100
Sulphur . . . . .	60	60	30
Lithium carbonate . . . . .	10	10	10
Sodium carbonate . . . . .	$\frac{1}{5}$	—	—
Potassium sulphate . . . . .	—	—	5
Quicklime . . . . .	—	..	100
Rubidium carbonate . . . . .	$\frac{1}{2}$	—	—
Bismuth nitrate . . . . .	—	—	A trace

The constituent substances are carefully melted together for three-quarters of an hour, and pulverised when cold.

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PORTRAIT OF A CRICKET. A true "close-up" of the inserts' head taken with an ordinary camera.



## “METALLIC” PHOTOGRAPHS

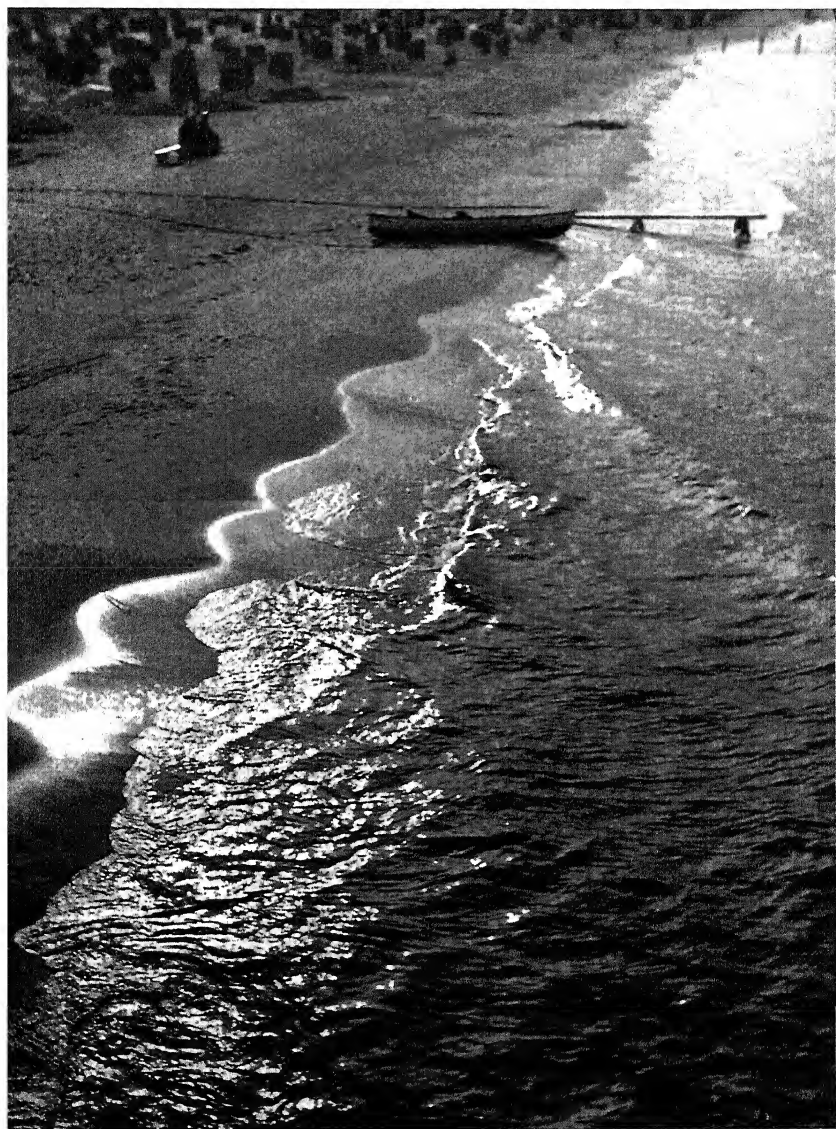
The use of papers coated with gold or silver foil as a substitute for a paper base in a positive image often gives a very striking result. The appearance of the picture is similar in some ways to that of a Daguerrotype, though the perspective depth is considerably greater, and the general image quality is nearly as good as that obtained by projecting a lantern slide on a silver screen.

A transparency is first made in the enlarger in the usual way, except that as the image must be reversed left-to-right the negative must be turned over in the carrier or the transparency exposed through its base. (The former method is preferable.) The image must essentially be a soft one, and it is important that none of the shadows appear blocked. After the plate has dried, both it and the metal-faced paper are coated with linseed oil, acid-free gum arabic solution, or canada balsam diluted with xylol, and the two carefully pressed into close contact so that no air-bells remain between them. After putting them under pressure for some time, the edges of the metal-faced paper are trimmed off flush with the glass, and the picture framed. The glass of the transparency serves as a framing glass, and by placing the picture so that the light falls obliquely on it the image will appear in all details with brilliant high-lights.

Brown toned transparencies are preferably placed over a gold surface, while plain black images suit silver-faced papers. Brown toning may be done by the uranium process or the copper process, but the sulphide process is preferable since it is less susceptible to deterioration from chemical action. In spite of the protection afforded to the image by the layer of oil or balsam, chemical effects may arise and the image fade. The sepia image given by sulphide toning has considerable resistance to such influences. In order to ensure that the images are properly lasting, care must be taken that no air can reach them. After framing, therefore, it is useful to cover the back of the metal-faced paper with good varnish to keep air from penetrating it. Celluloid varnish and copal are both suitable.

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CALM AFTER THE STORM. Folding camera and panchromatic plate. *f*/6.8, light yellow filter, and  $\frac{1}{50}$ th second exposure. Mounted on a metal-faced paper.



## PRINTING ON SILK

There are quite a number of photographic subjects which can be printed on to prepared cloth and give an extremely pleasing result. Various formulae for sensitising the cloth have been quoted from time to time, and all of them give slightly different image colours. The simplest methods are probably those following.

(1) Silk can be floated on top of a solution of dye in ordinary washing starch, and after drying in the dark may be painted with a 6% solution of potassium bichromate. It is then dried in the dark again, and is ready for printing. Development consists of washing in clean water, when the unexposed portions of the image will wash out and leave an insoluble image on the silk. Development should not be hurried by rubbing the surface of the silk, since this would remove the image itself. The process of development should be allowed to proceed slowly by itself.

(2) Another method necessitates making up a solution of 150 grains ferrous oxalate and 62 grains of silver nitrate in 2 fluid ounces of water (the water must be distilled, and the chemicals should be dissolved in the above order). The silk is bathed for 3 minutes in this solution in the dark, and dried. After printing to about half the density required in the finished print, the silk is washed for ten minutes or so in running water, and then fixed for the same time in 5% hypo solution. Finally, it is well washed, and dried.

(3) A rather similar recipe also gives good results. The two solutions below are first made up.

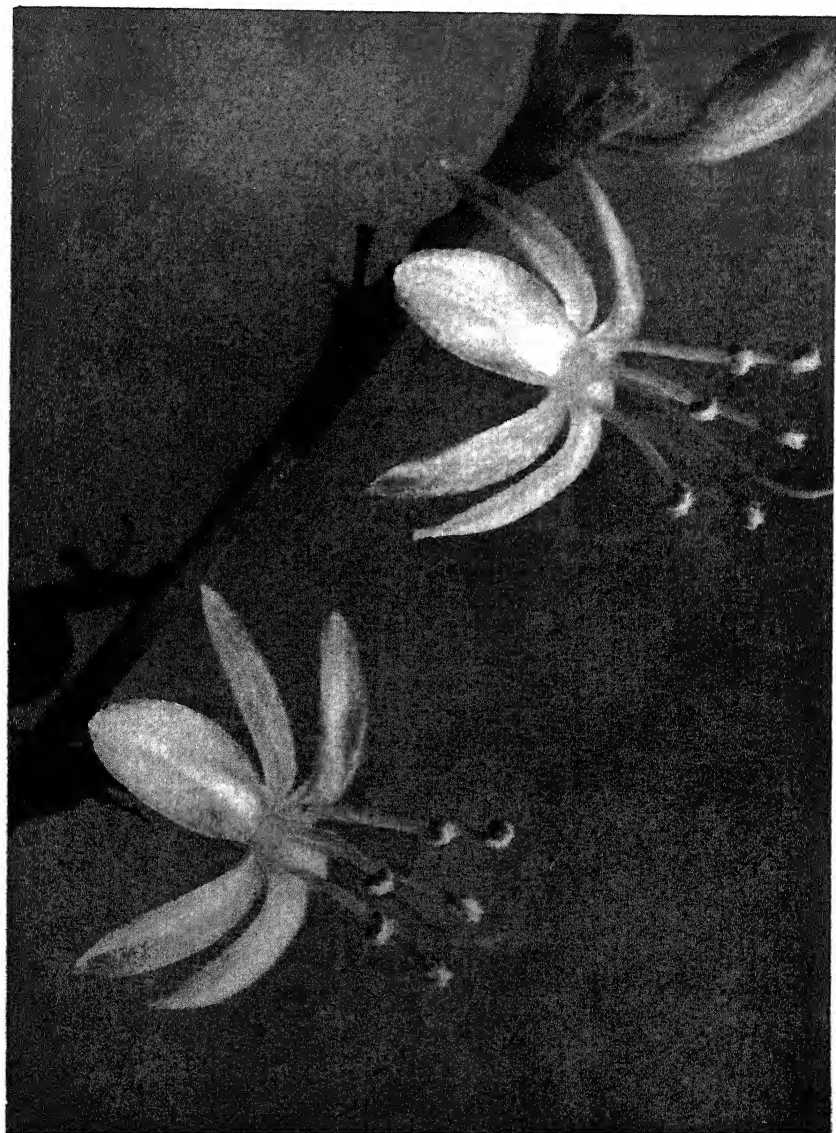
"A"		"B"	
Water	2 fluid oz.	Water	2 fluid oz.
Citric acid.	90 grains	Silver nitrate	90 grains
Ferric ammonium citrate	230 grains		

For use, mix equal parts of "A" and "B", and immerse the silk in the solution. Then dry in the dark. Printing, development, and fixing follow, as in the example above.

Should the silk refuse to lie flat, a flat-iron may be used to press it.

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PAMPAS GRASS FLOWERS. Printed on silk fabric by the process described above.



## LETTERING AND PICTURE TOGETHER

Lettering is usually painted over a print or enlargement if it is to be included in the picture, but this has the disadvantage that a copy negative must be made. The copying process inevitably loses detail and gradation from the original, and the method described below is much more satisfactory.

Black letters are written on a white card with indian ink for the text, and this has the advantage that mistakes can be corrected with "process white" paint before the photograph is taken. The card is then copied on a contrasty process plate, and developed and fixed as usual. After this, the original negative and text can be successively printed on a single sheet of bromide paper, and the text may be placed anywhere desired merely by moving the paper on the easel.

White lettering demands another step in the operations. The picture negative is first placed in the enlarger and a sheet of paper the size of the wanted print placed on the easel. The place where the text is to come is carefully marked, and the lettering drawn on the paper with black ink in the ordinary way. A negative is made of the text, and then a transparency positive from it, which should show dense black lettering on a clear ground. Since the lettering will be reversed left to right, the positive transparency is placed emulsion to emulsion with the picture negative and the two enlarged simultaneously. If the density of the transparency is sufficient, the text will stand out in bold white letters against the picture. In order to have the lettering correctly placed in the picture, it is necessary to arrange the position of the text on the ground glass screen when it is being copied.

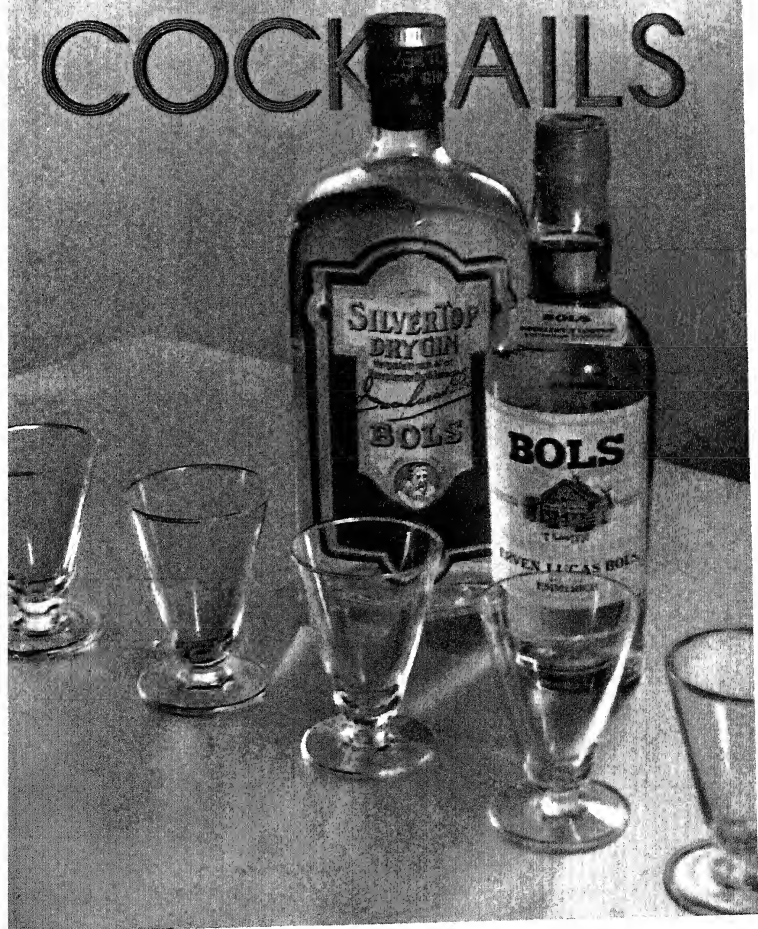
Both of these methods have the advantage that the text is copied on a process plate, and thus loses its "hand-made" appearance. If a softer plate were used, the little deficiencies would probably be very apparent. The great advantage of using this printing-in process is that the result is a genuine enlargement, and not a reproduction of a photograph that has had lettering printed over it.

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POSTER: Text and picture combined in a single print.

# BOLS

## COCKTAILS





## LETTERS WITHOUT PEN AND PENCIL

It sometimes happens that a photograph must have some explanatory text included. A photographic "Ex Libris" or a postcard, as examples, present difficulties in relating the text to the picture, for the text is a graphic abstraction while the picture is a record of reality. Some style of text suited to the occasion can sometimes be found which is a direct part of the picture and is not drawn with pen or pencil.

As an example, a picture of a woolly doll may be titled with printed lettering, or the wool itself used to form the letters. The effect of the two is not identical, for while one is written script the other is purely photographic in character. It might be better, in another instance, to show someone writing on the beach with a stick than to include a descriptive text in ordinary lettering in the picture.

All kinds of possibilities exist for this kind of "writing". Tinsel, confetti, or small stones can be arranged to form words; letters can be cut from paper; pieces of wood can be laid out as letters; metal can be punched to form script writing. In this last case there is no need to work with hammer and punch: a sheet of foil or metal-faced paper is quite satisfactory provided that it is placed on a soft material and a hard stylus used to impress the letters into the surface. Those whose hands are too heavy for good drawing will find that a substitute for script is a good deal more simple, apart from being more satisfactory in appearance.

Really unusual effects can be produced photographically by combining negative and positive. A simple printed text is all that is necessary, and the two are merely enlarged together out of register. Remarkable shadow effects are produced. It is naturally essential that neither the negative nor the positive is very dense, for when they are superimposed they must still let sufficient light through, and show a grey tone in which the letters are seen light with dark shadows.

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LETTERING AS PART OF THE PICTURE. Showing the unusual result of using material instead of written letters.



## PLATE-SUNK MOUNTING CARDS

No picture really looks at its best until it is mounted, and since a photograph resembles a drawing in image character it should be similarly mounted. The trouble is that coloured mounts and the modernist styles of mounting cards so popular recently do not seem to accentuate the print as they ought to, while a plain white mount sometimes makes it difficult to see exactly where the picture ends and the mount begins. In this last case, plate-sinking the mount helps to some extent, and has also the advantage that it brings the print surface and mount surface to the same level when the two are framed.

Plate-sunk mounts can of course be bought, but no maker can afford to make and stock all the strange and unusual sizes and shapes that seem to be produced by photographers by trimming their prints. It is much cheaper to sink the mount at home, and this may be done by cutting a sheet of thick card about  $\frac{1}{8}$ th of an inch larger on all sides than the print. The bottom border can be made wider if it is desired to write there one's name and the title of the print.

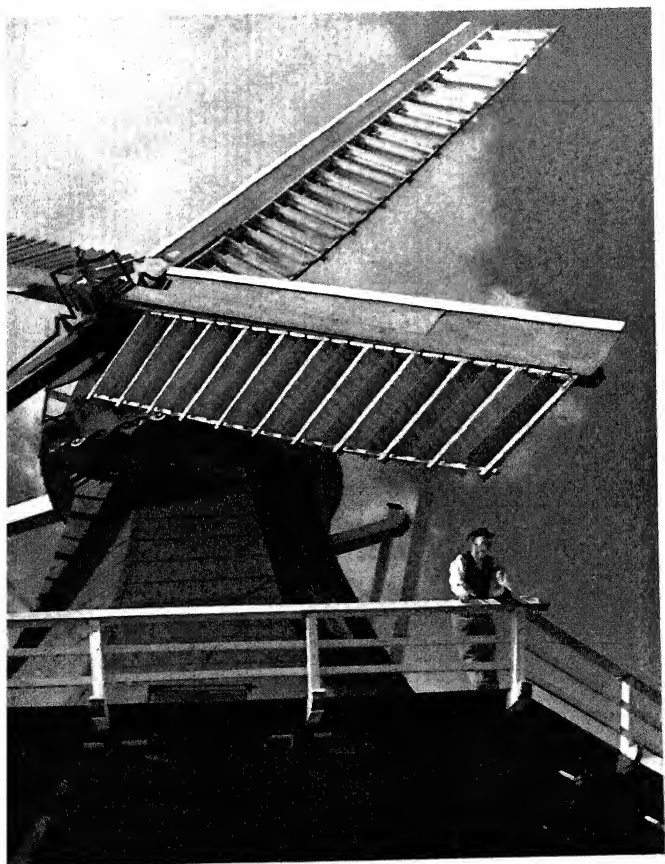
This card is laid exactly in the centre of the mount, and the two turned over and laid on a table so that the mount is on top. By pressing down the mount over the card with the handle of a table knife or the round back of a penknife, a sunk area will be produced, and it only remains to paste the print accurately in the centre of this area. Since the card was larger than the print, a narrow border will appear round it.

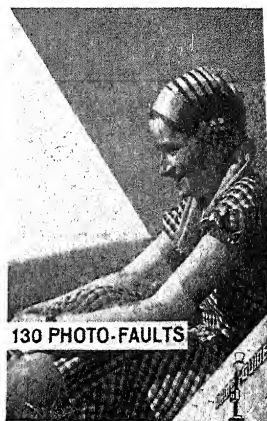
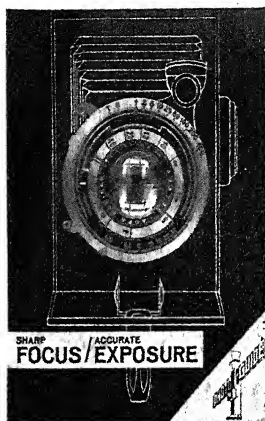
A similar border effect can be produced as follows. The print is first mounted, and a sheet of paper about an eighth of an inch larger each way than the print is blackened at the edges with a soft lead pencil. By placing the sheet of paper over the print, and rubbing the edge with the finger, a softly graded graphite border is rubbed on to the mount, and it shades off into the white mount a little distance from the paper edge.

Glazed prints are very sensitive to any paste containing water, and a trace of moisture is quite enough to spoil the glossy surface. All glazed prints should thus either be dry-mounted with tissue and a hot iron, or else a paste should be chosen that is free from water.

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FRIESIAN WINDMILL. Roll-film reflex and panchromatic film.  $f/8$ , light yellow filter,  $\frac{1}{50}$ th second exposure.

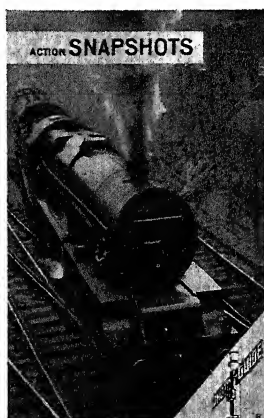
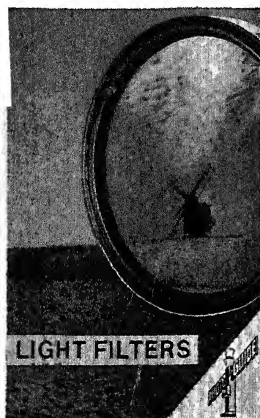




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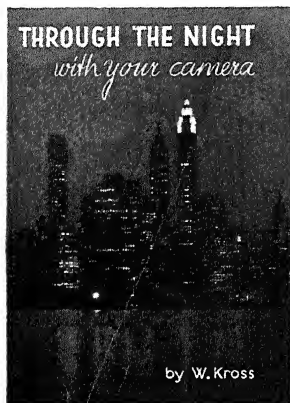


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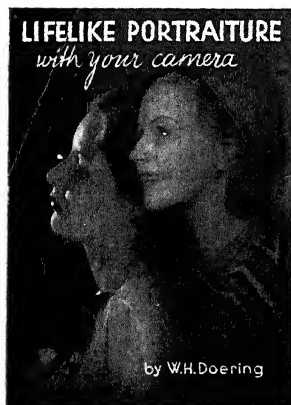
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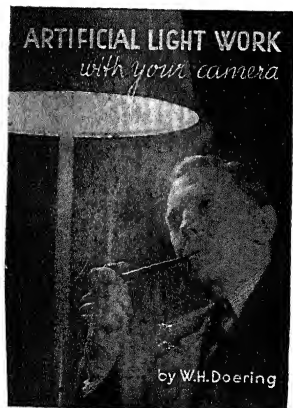
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Those who have hesitated to use their cameras at night, will with the aid of this handbook be able to tackle its problems with confidence. The author deals with the technical problems, with the questions of suitable apparatus and materials while all his instructions are effectively simplified by remarkably fine examples of night photography. This book is really a guide through the night with your camera.



Richely illustr. Cloth. Price about 5/- • \$2.—

Portraiture is probably the most popular branch of photography. Also this book will be popular with the amateur, as whatever means are suggested by the author, they will be within the scope of the amateur portraitist. He is shown how to produce good portraits by the simplest means, whether he is in or out of doors. The illustrations are instructive and exemplary, and the drawings showing lighting effects extremely clear and helpful.



Richely illustr. Cloth. Price about 4/6 • \$1.75

Whether a match, an oil-lamp or a camp fire be the source of light, you will find advice on the best method of working to make successful photographs without daylight. Flash light, Photoflood or Half-Watt, all sources of artificial light are dealt with in this complete guide. There are many examples of "trick" and straight lighting by well known workers to help the amateur make the best of this interesting branch of photography.









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